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Per. 2333 d.  $\frac{16}{35(2).[10^6]}$









35TH CONGRESS, }  
2d Session. }

HOUSE OF REPRESENTATIVES.

{ Ex. Doc.  
{ No. 105.

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# REPORT

OF THE

# COMMISSIONER OF PATENTS

FOR THE YEAR 1858.

---

ARTS AND MANUFACTURES,  
IN THREE VOLUMES.

---

VOLUME III.

---

WASHINGTON:  
JAMES B. STEEDMAN, PRINTER.  
1859.





IN THE HOUSE OF REPRESENTATIVES,

*March 2, 1859.*

***Resolved,*** That there be printed of the Mechanical part of the Patent Office Report five thousand copies for the use of the Patent Office, and fifteen thousand for the use of the members of the House of Representatives.

***Attest:***

**J. C. ALLEN, *Clerk.***



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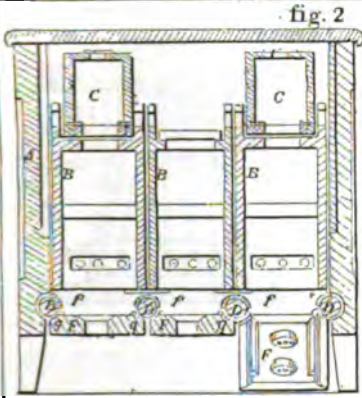
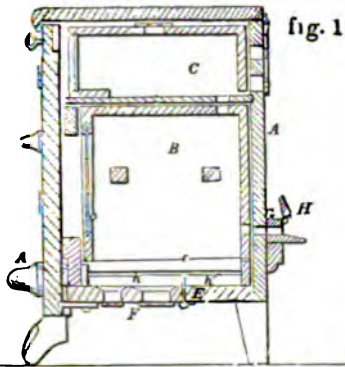
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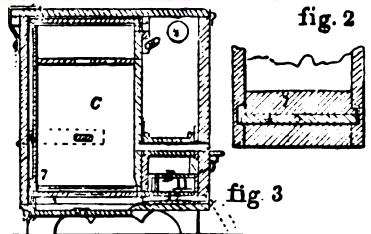
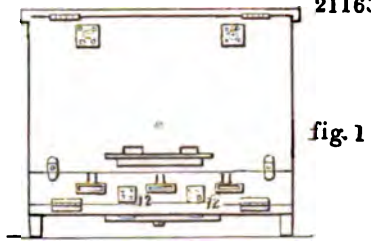
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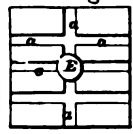
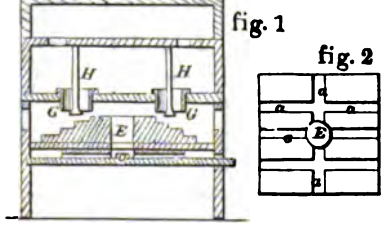
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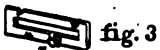
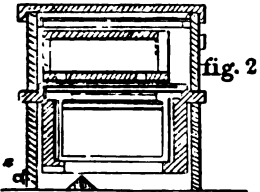
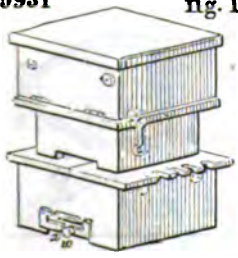
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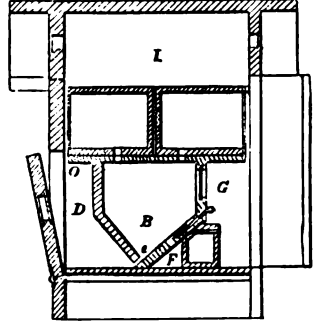
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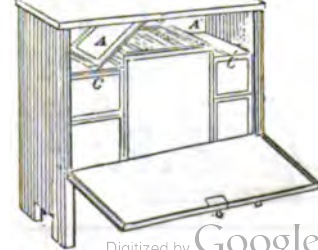
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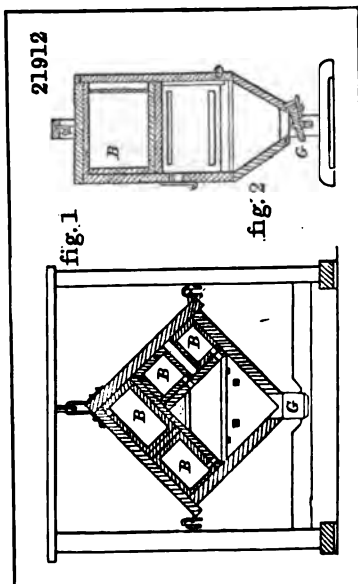
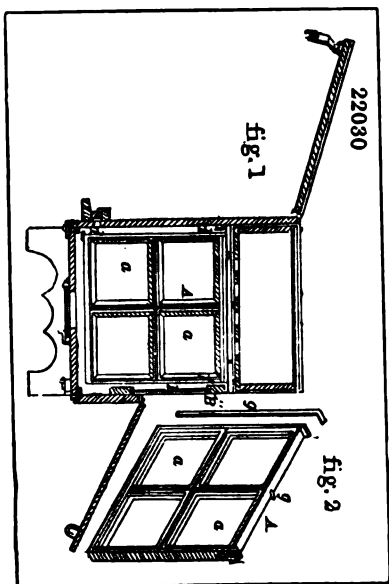
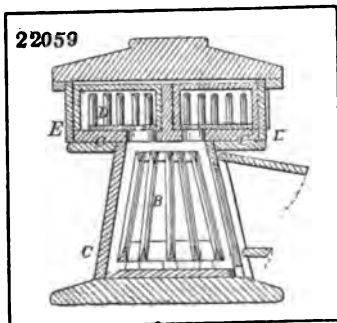
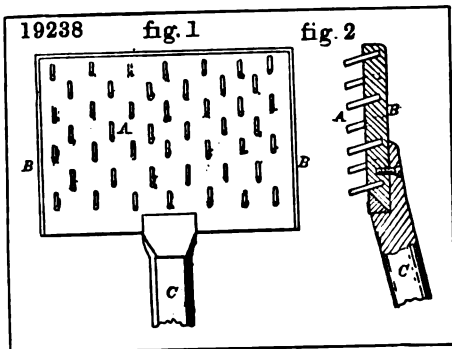
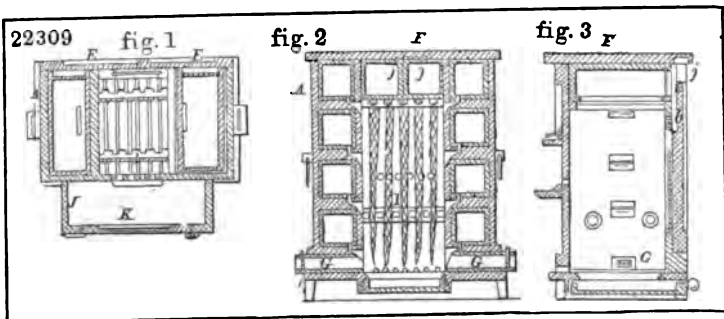
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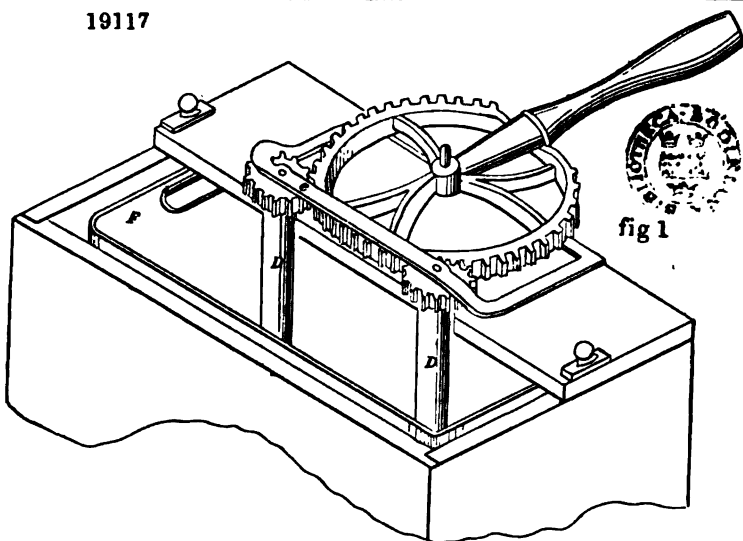
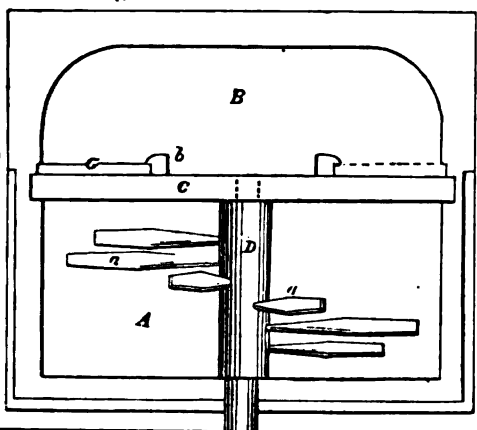


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fig 2

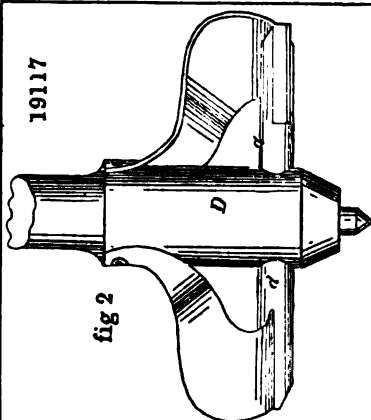
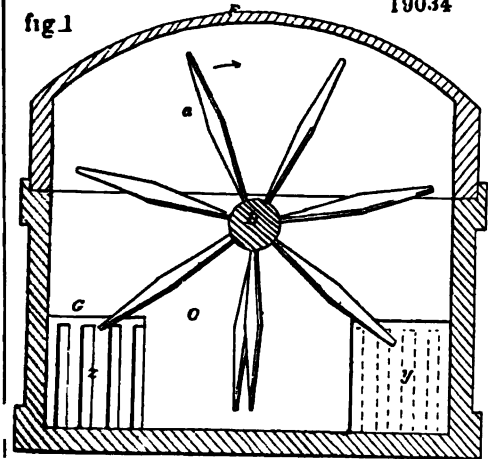
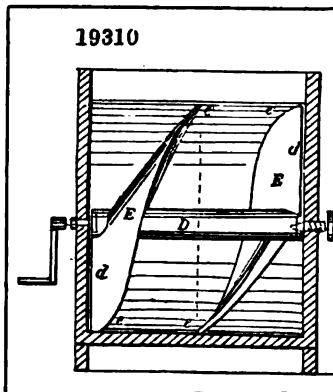


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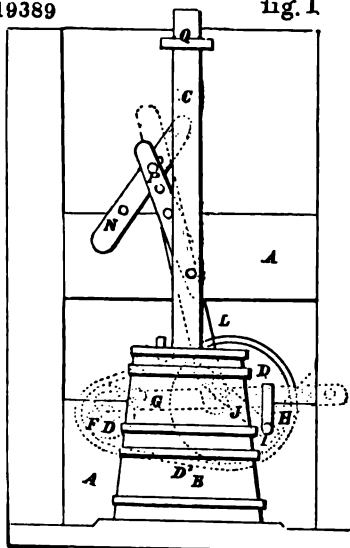
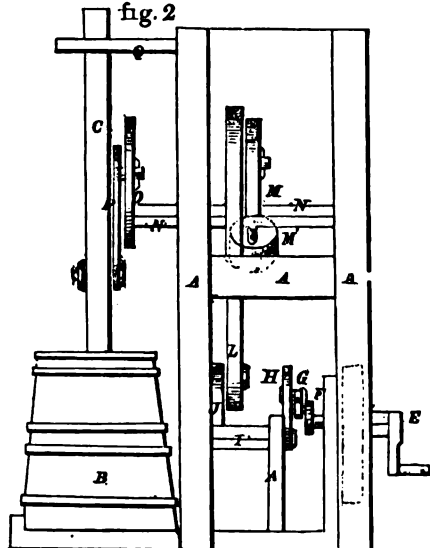


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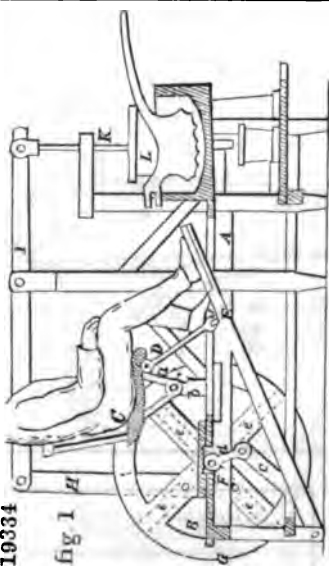
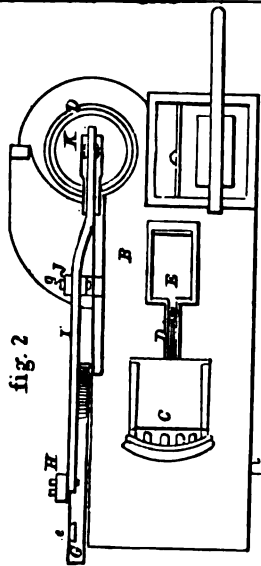
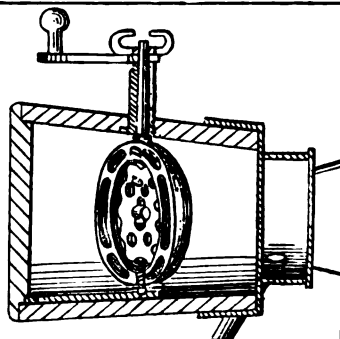


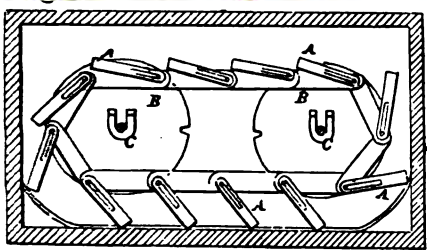
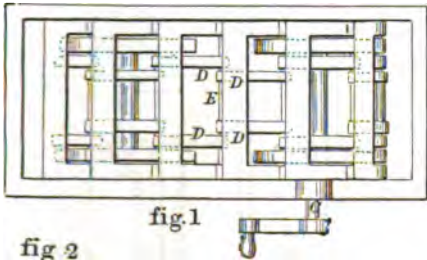
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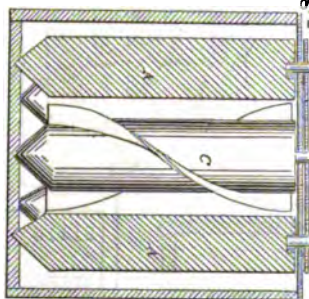
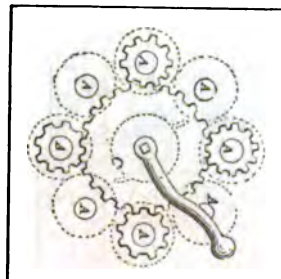
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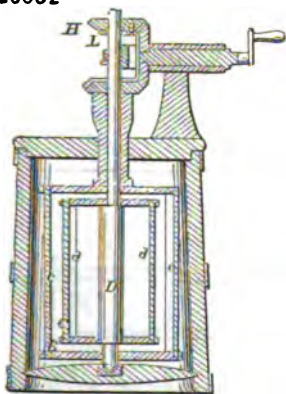
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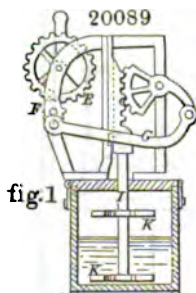


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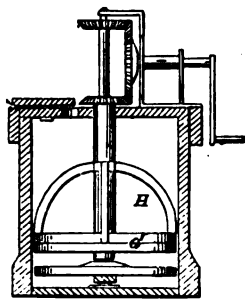


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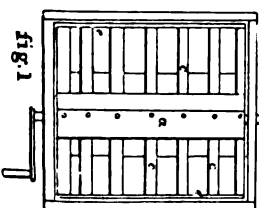
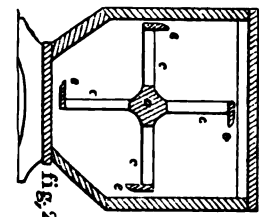
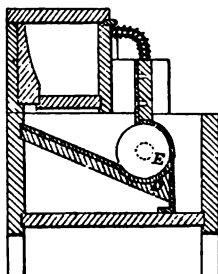


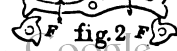
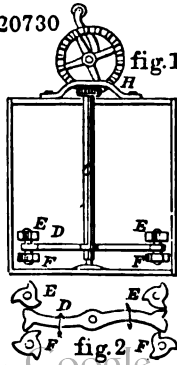
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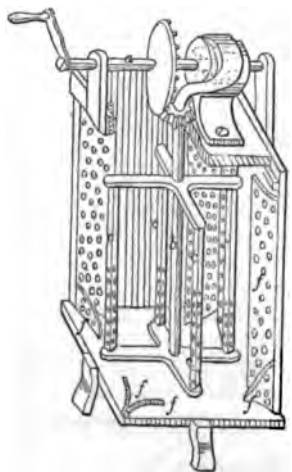
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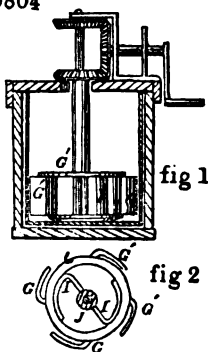
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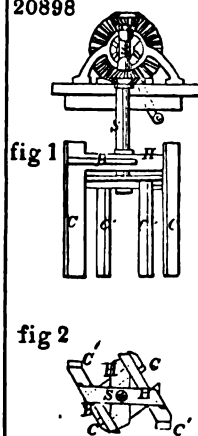
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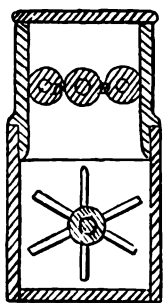
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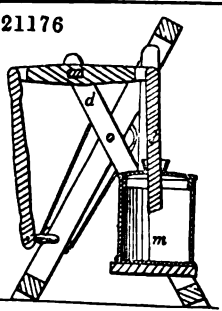
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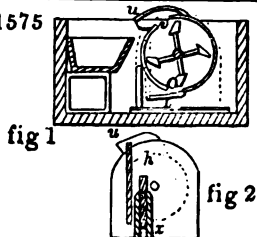
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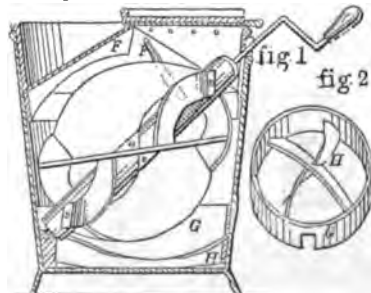
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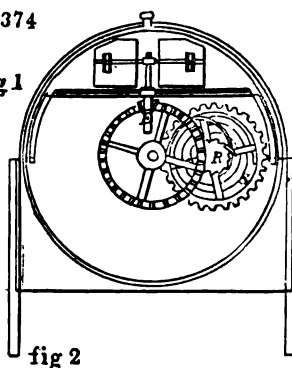


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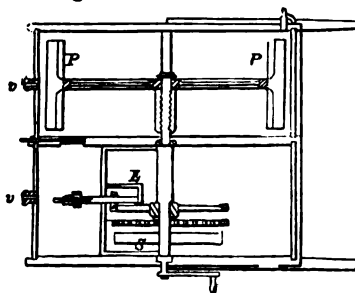
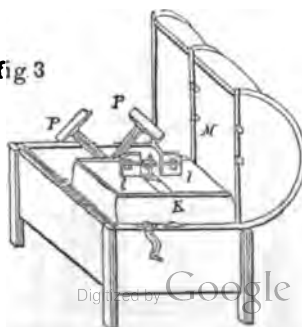
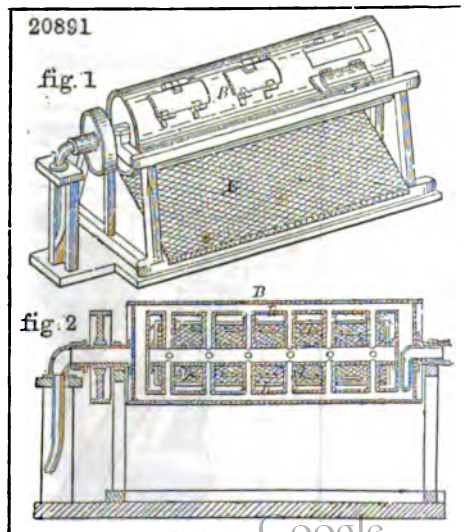
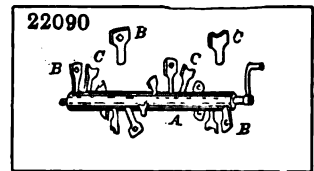
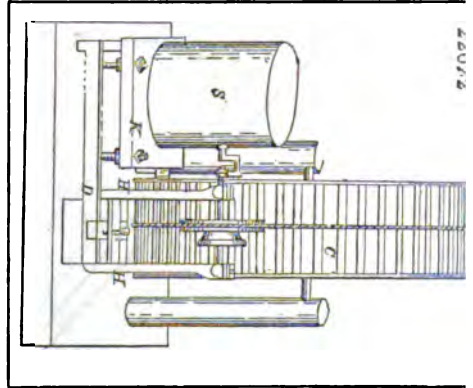
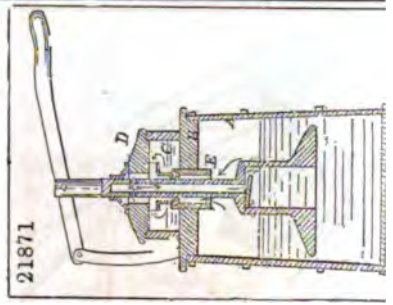
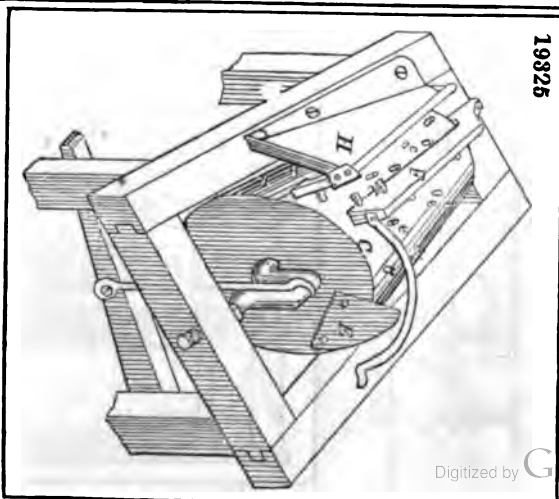
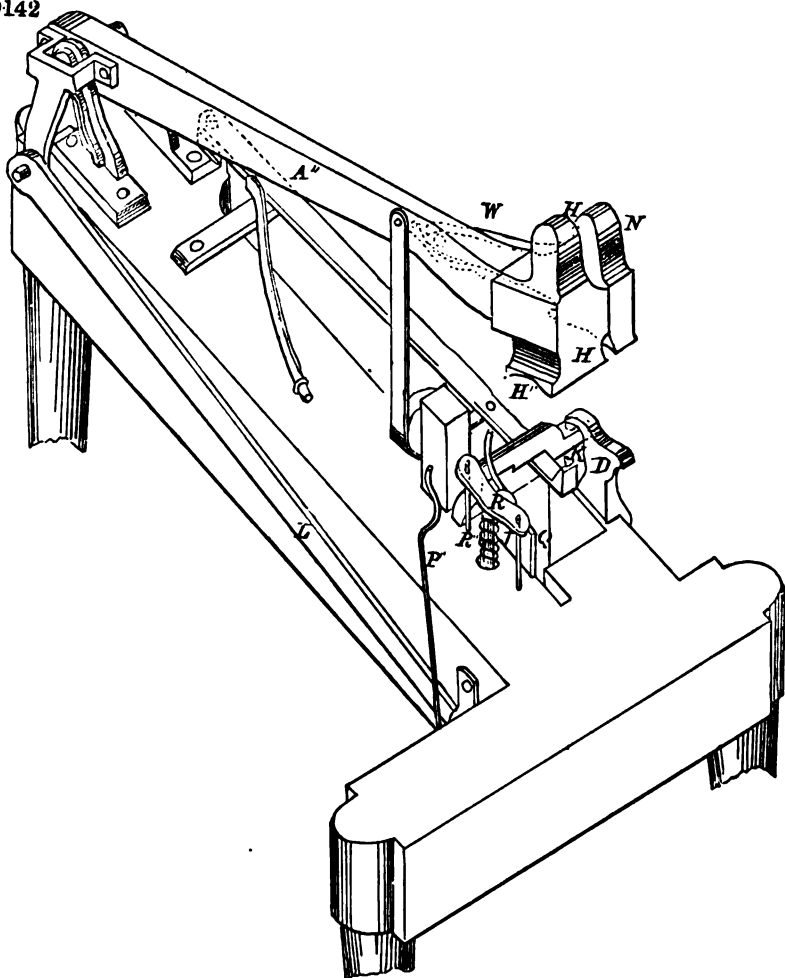


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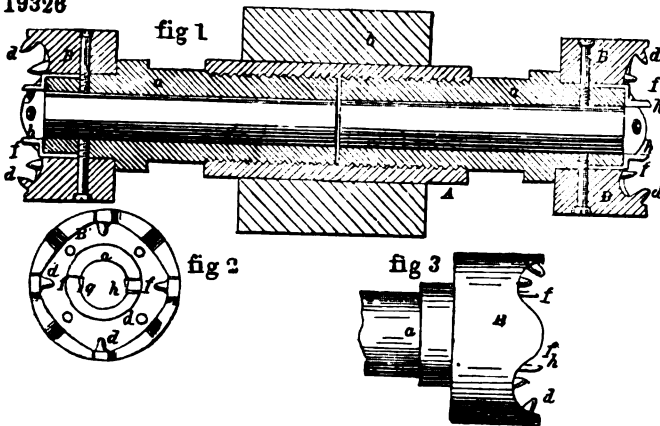
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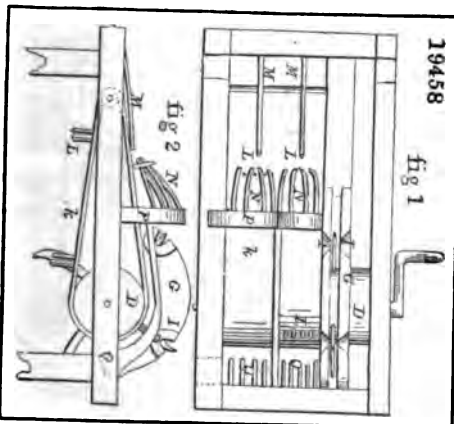
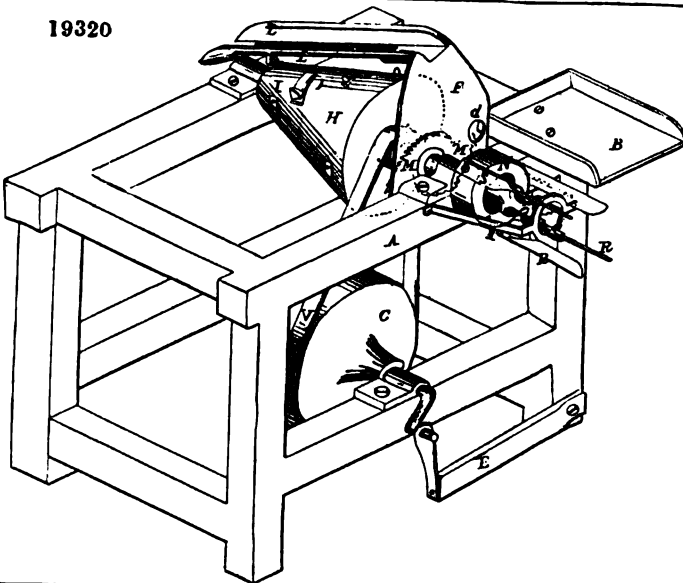
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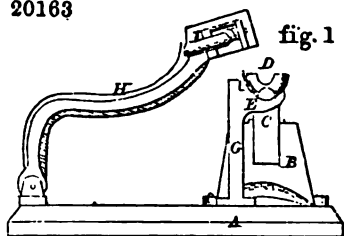


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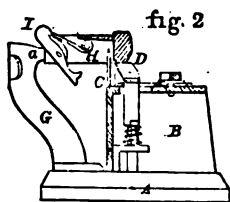


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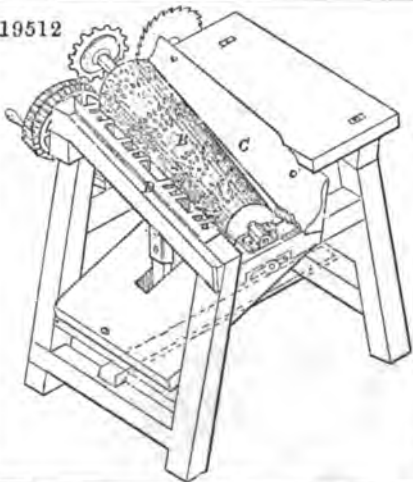


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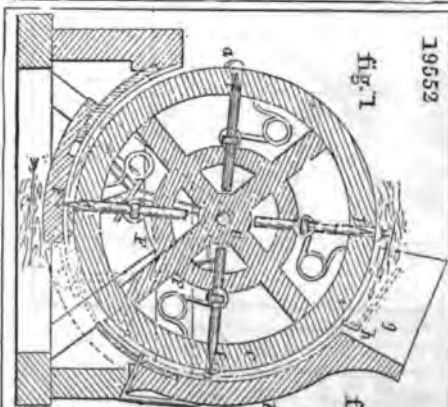


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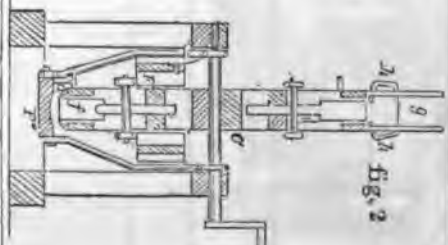


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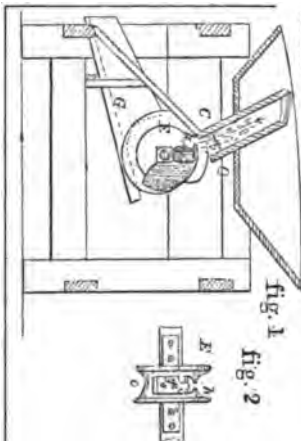
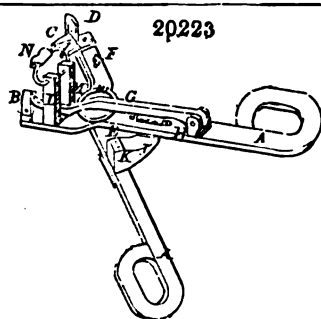


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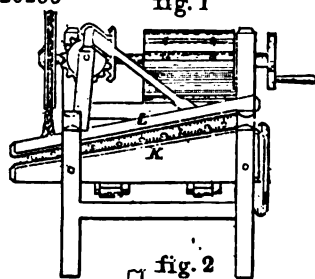


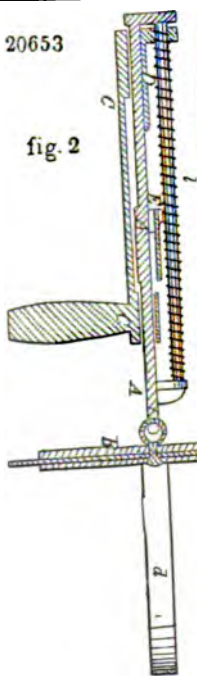
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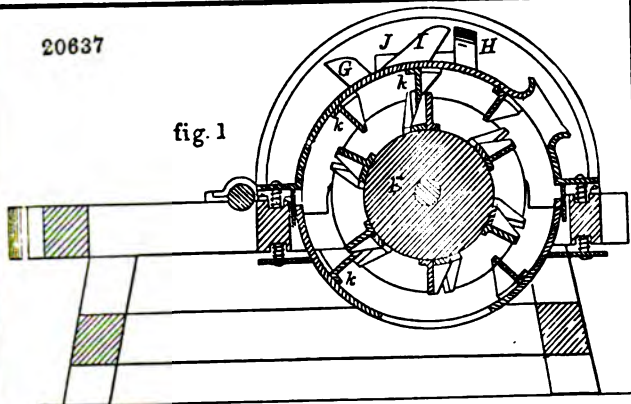
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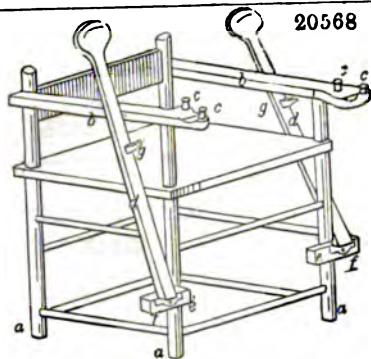


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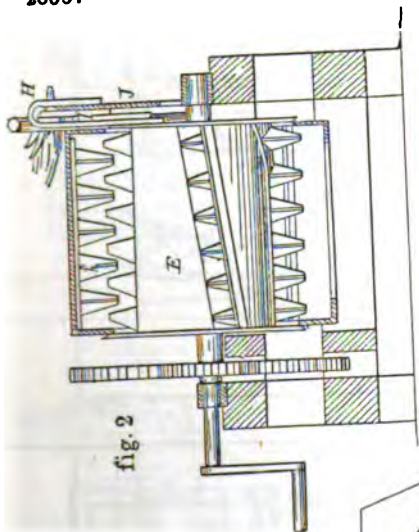


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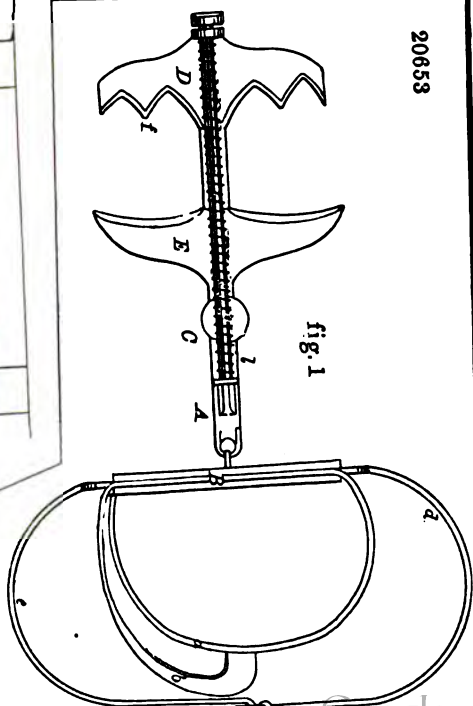
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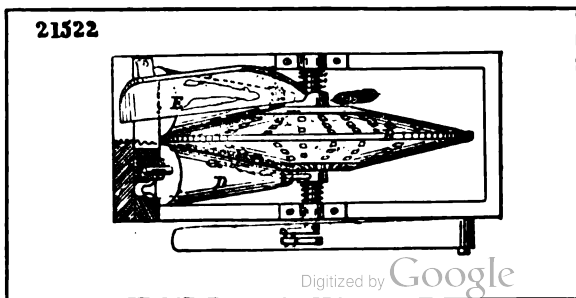
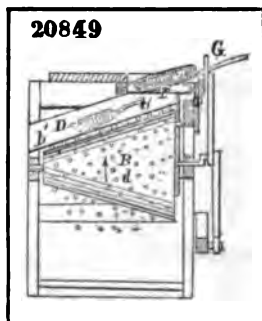
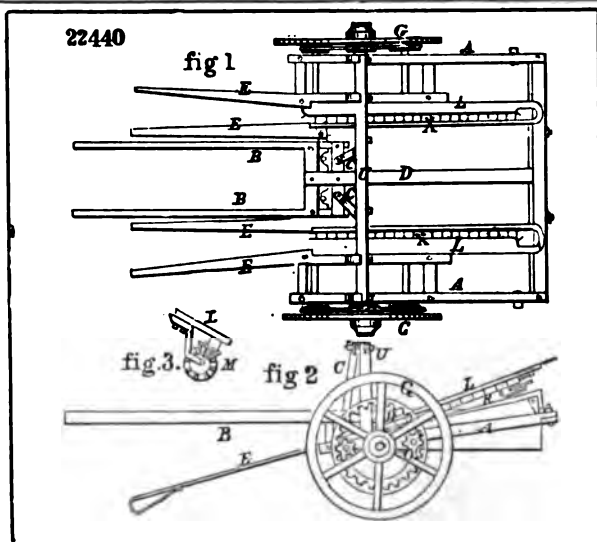
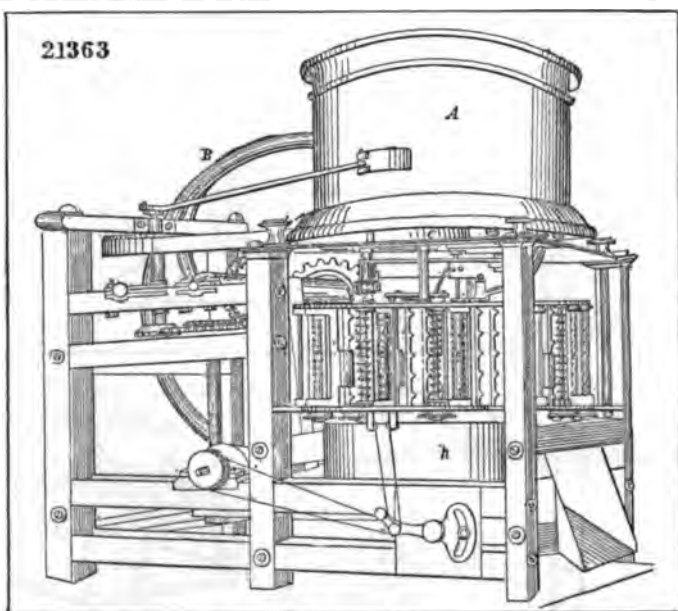
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fig. 1





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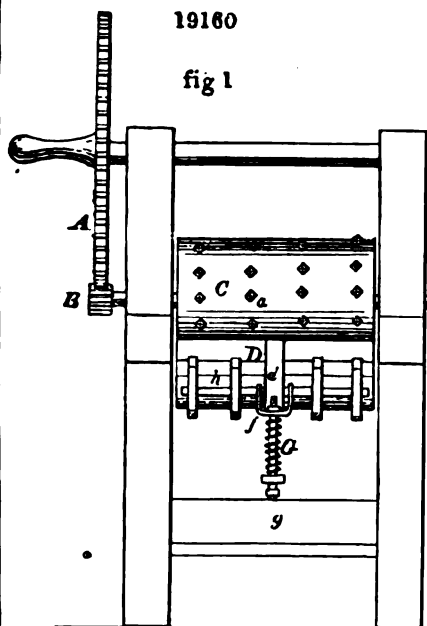


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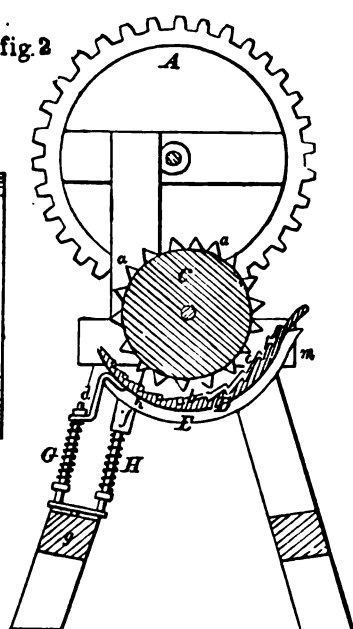
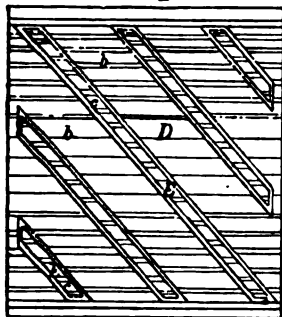
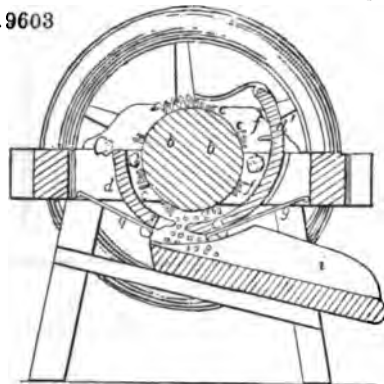


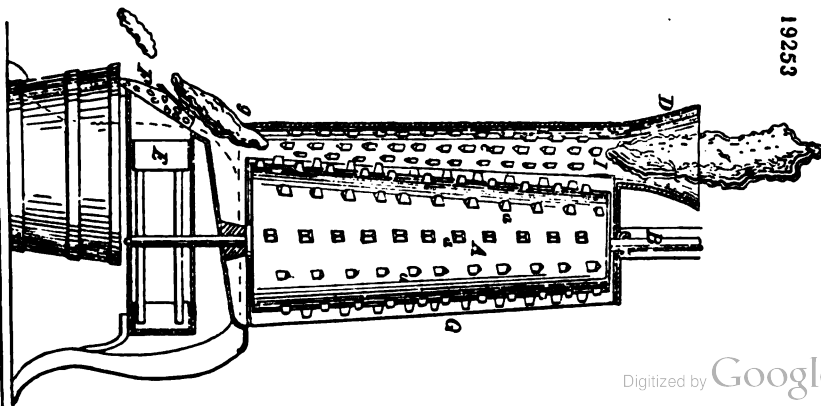
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fig. 1

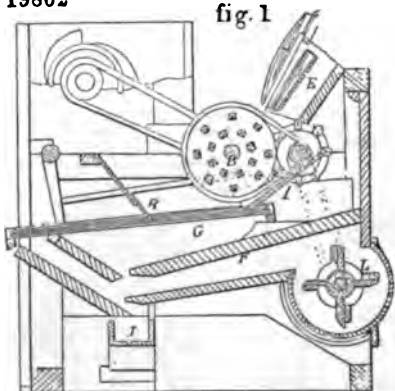
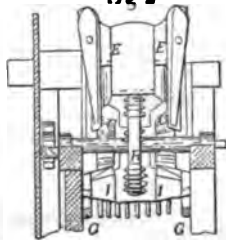
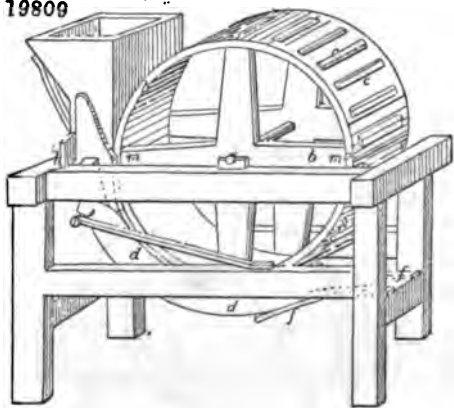


fig 2



19809



20266

fig. 1

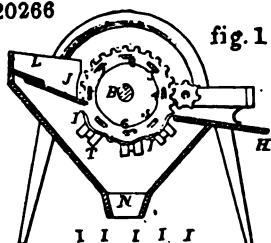
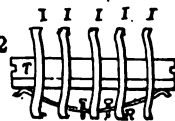


fig 2



19915

fig. 1

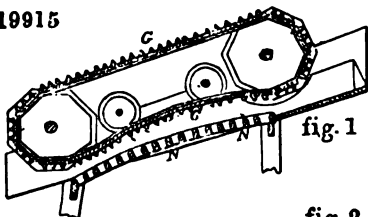
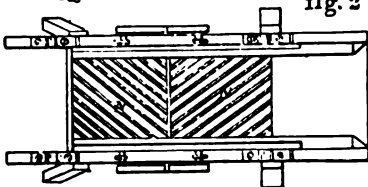
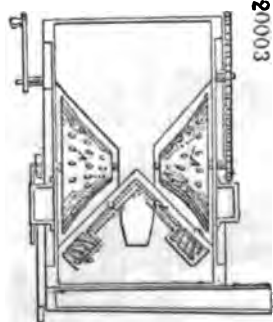


fig. 2



20003



20650

fig. 1

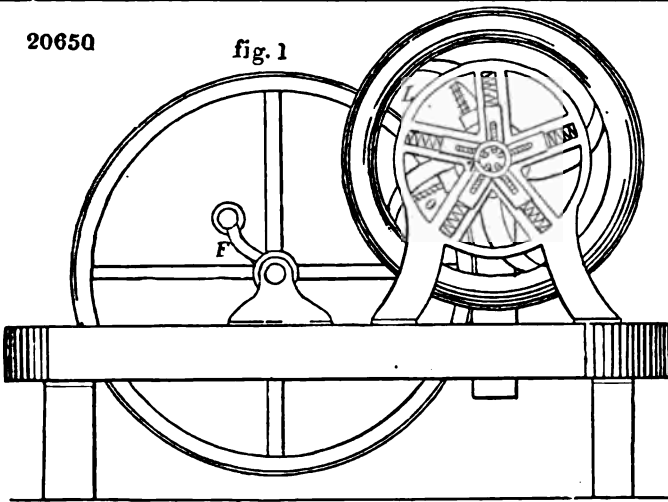


fig. 2

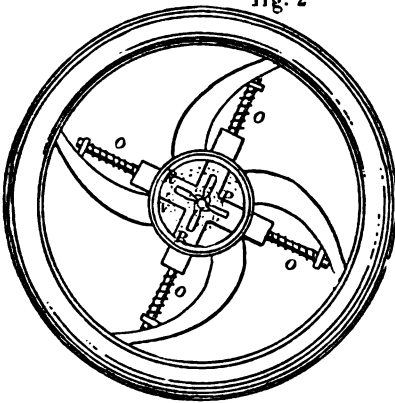


Fig 3



20831

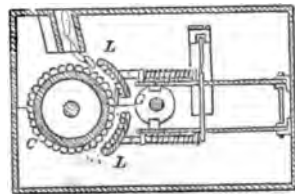
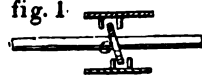


fig. 1

fig. 2



21174

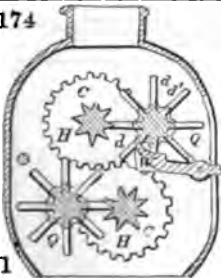


fig. 1

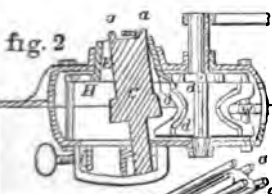


fig. 2



fig. 3

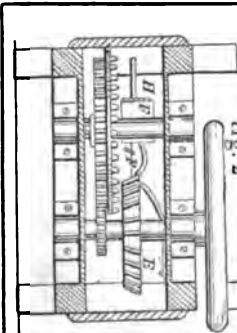


fig. 2

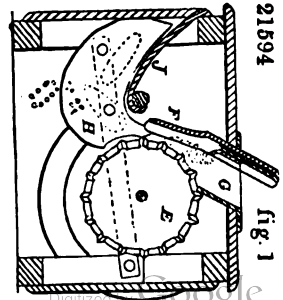
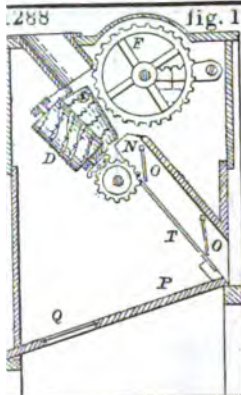


fig. 1

21594





22206

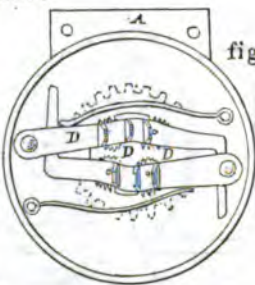
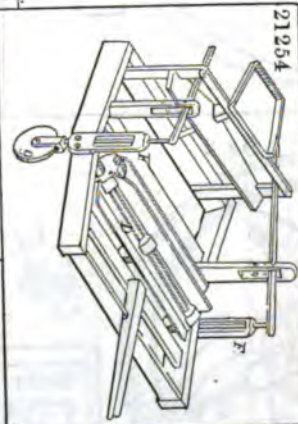
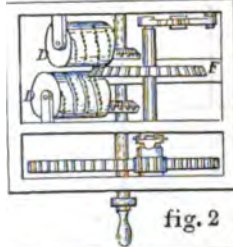
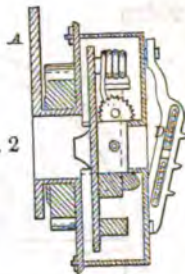
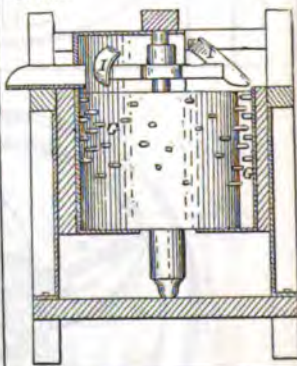


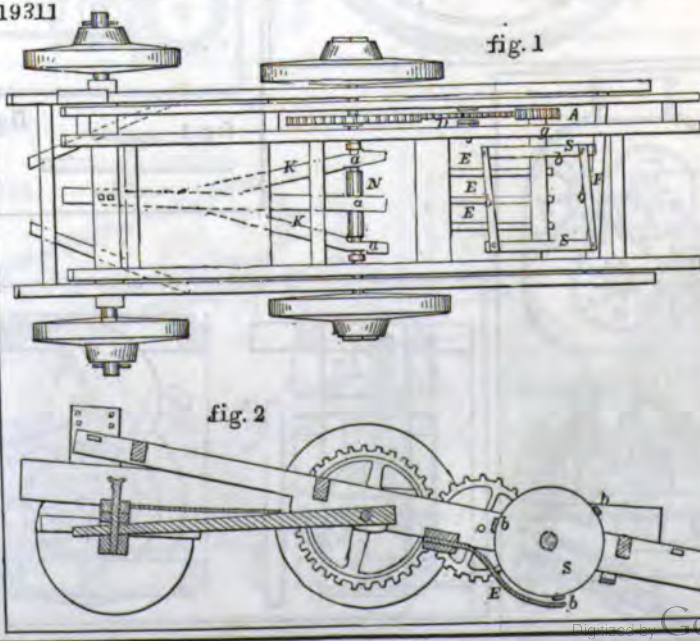
fig. 2

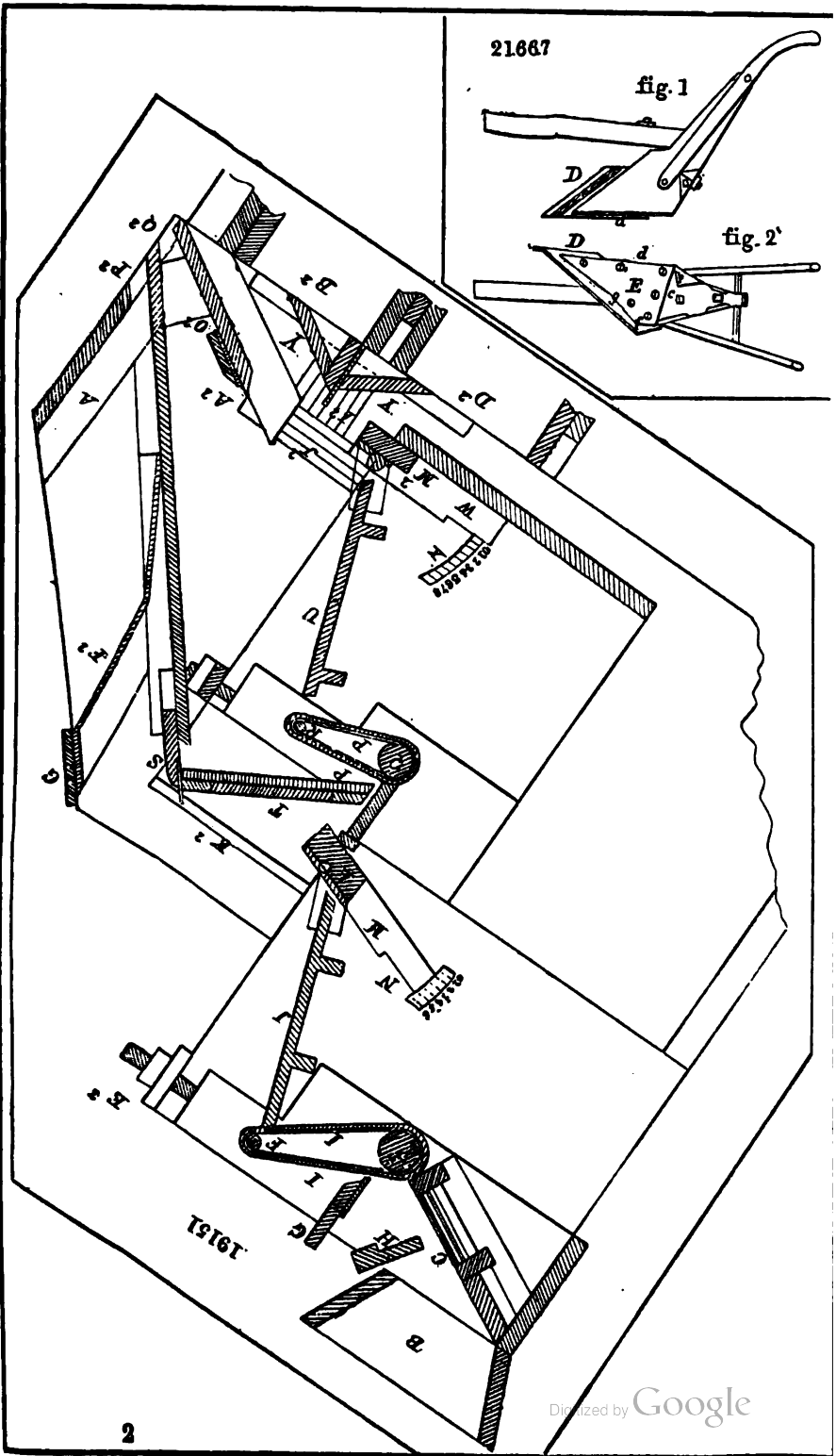


19561



19311





19248

fig. 1

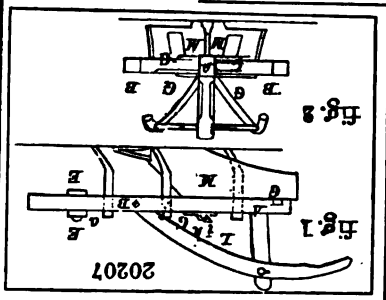
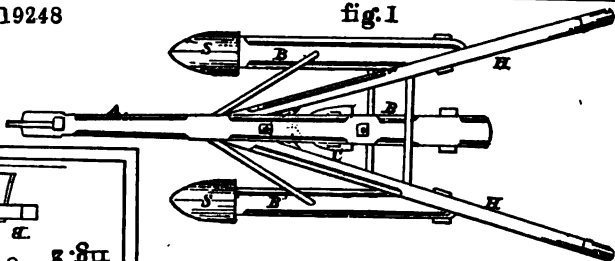
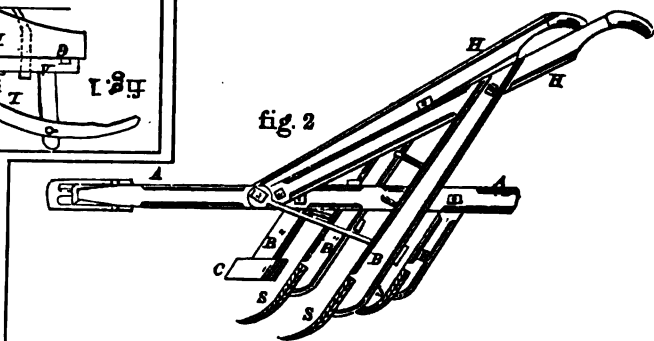


fig. 2

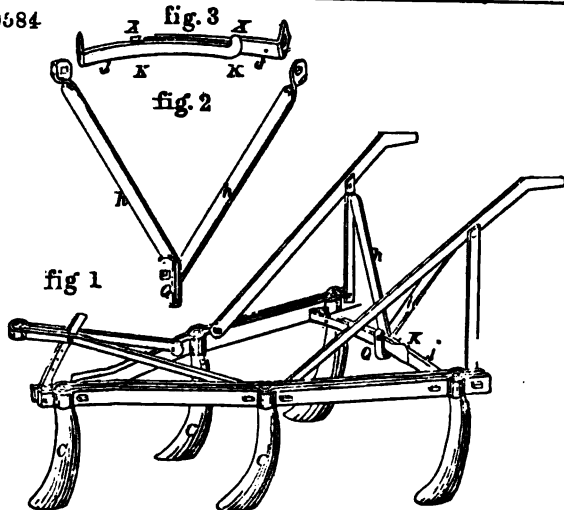


19684

fig. 3

fig. 2

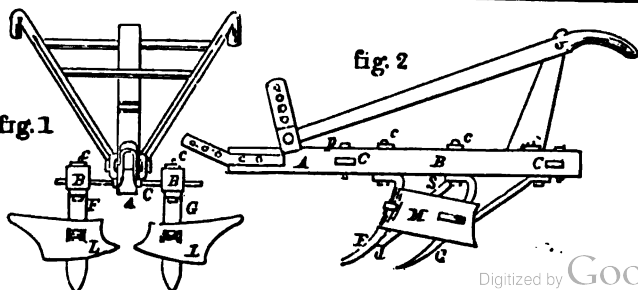
fig. 1

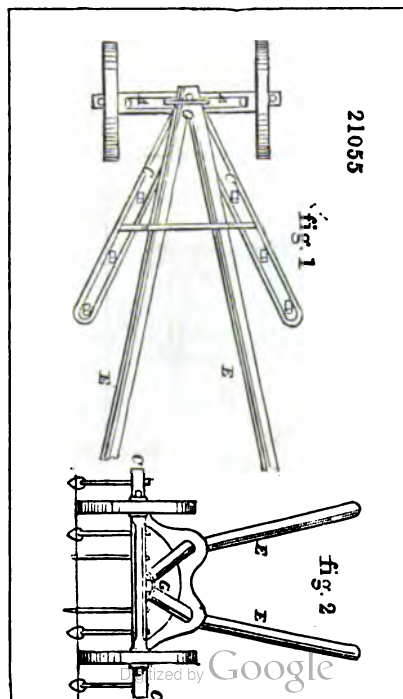
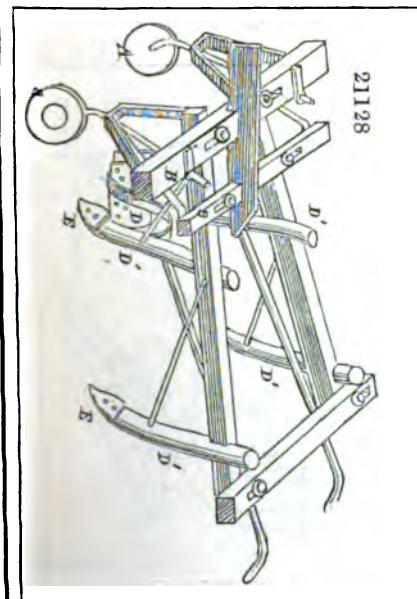
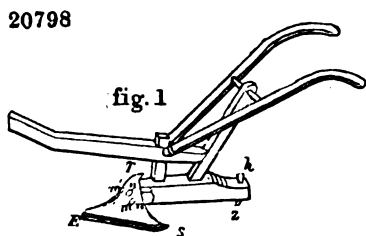
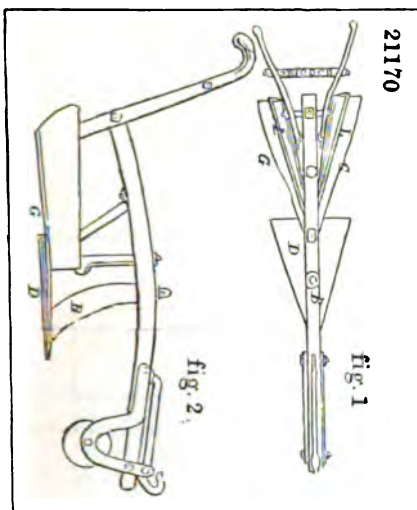
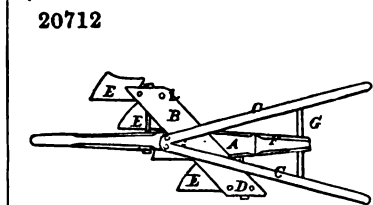
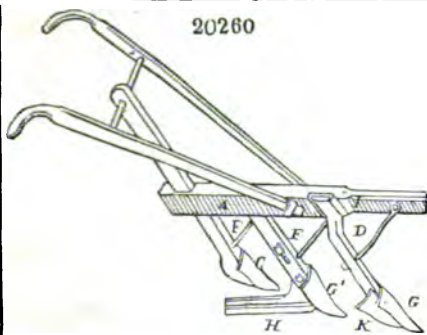


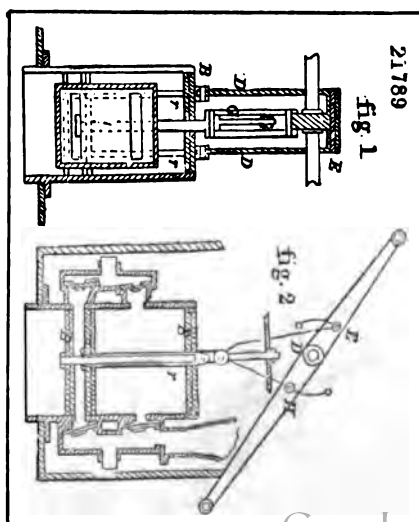
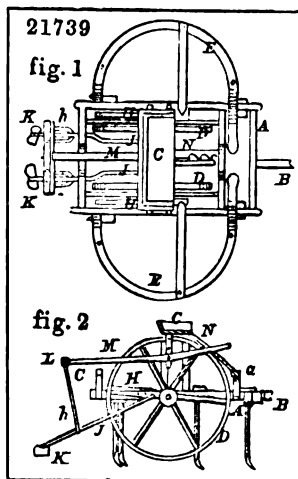
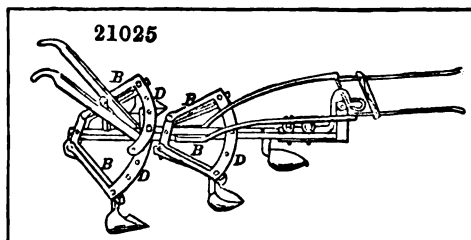
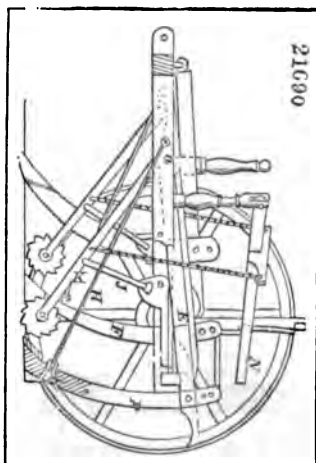
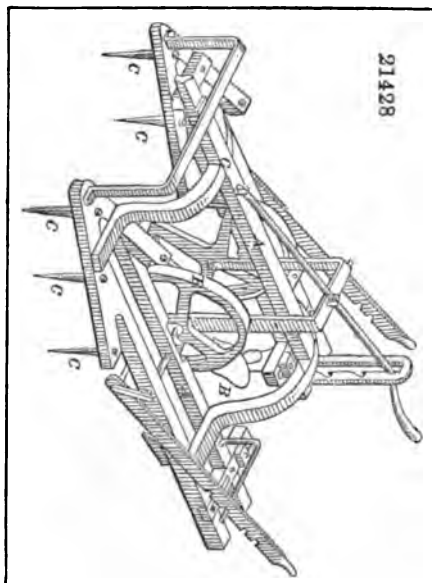
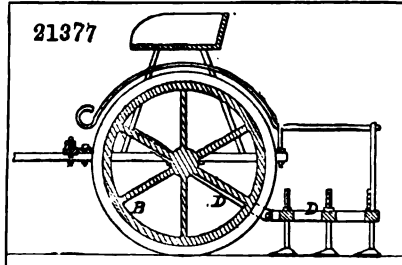
19742

fig. 2

fig. 1







21857

fig. 1

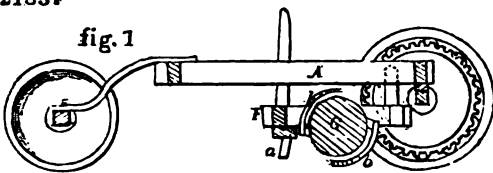
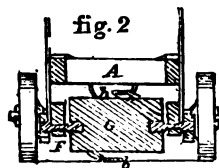
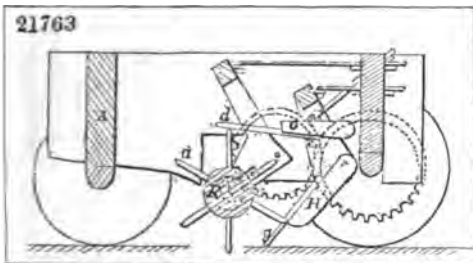


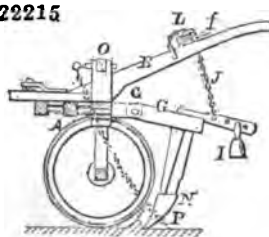
fig. 2



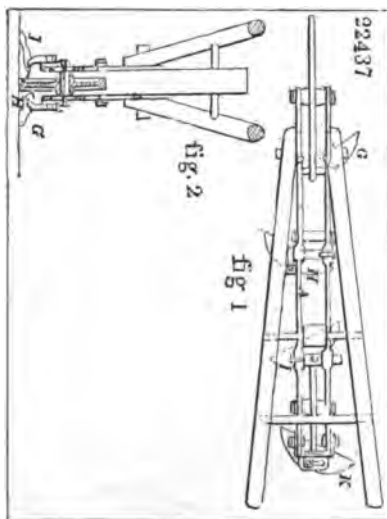
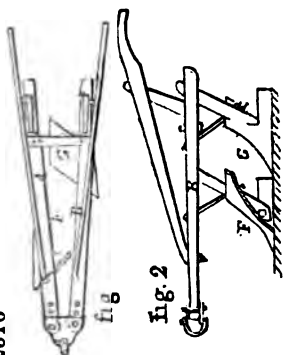
21763



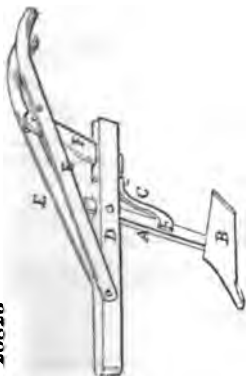
22215



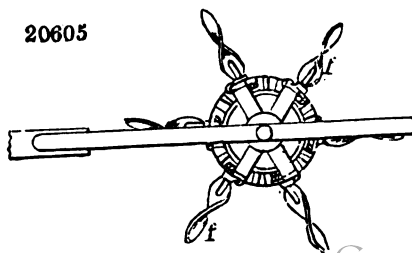
22316



20823



20605



19234

fig. 1

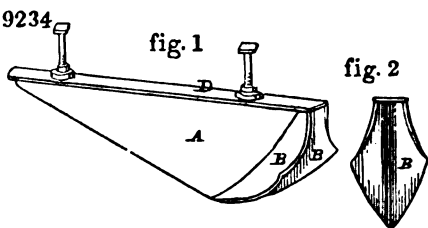
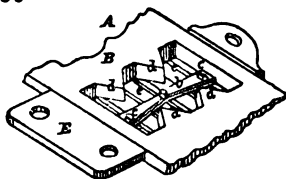


fig. 2



21736



21212

fig. 1

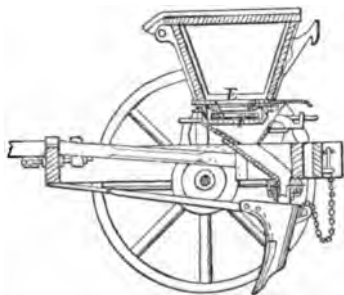
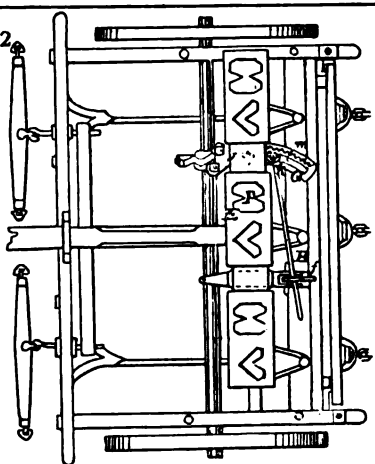


fig. 2



19633

fig. 1

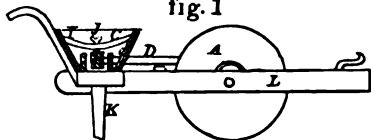
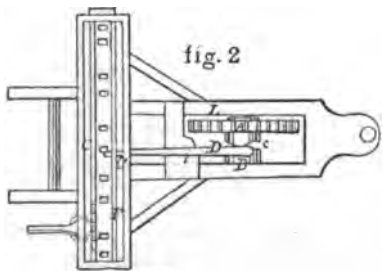
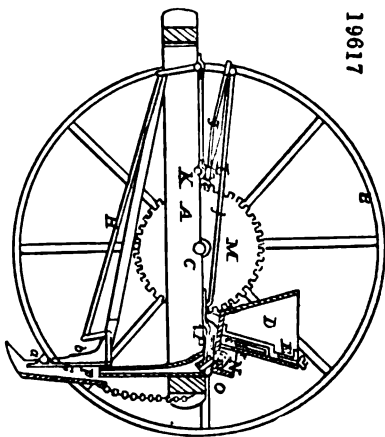


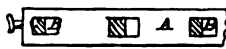
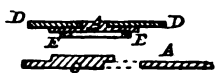
fig. 2



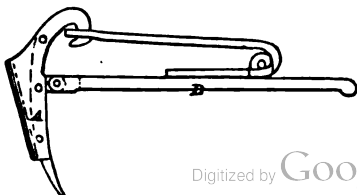
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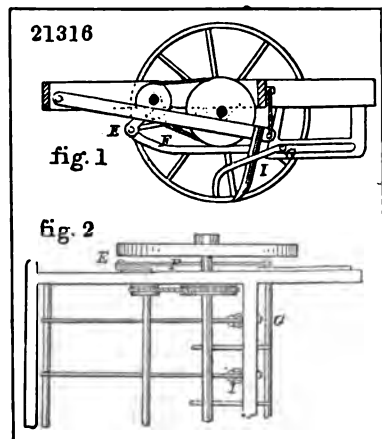
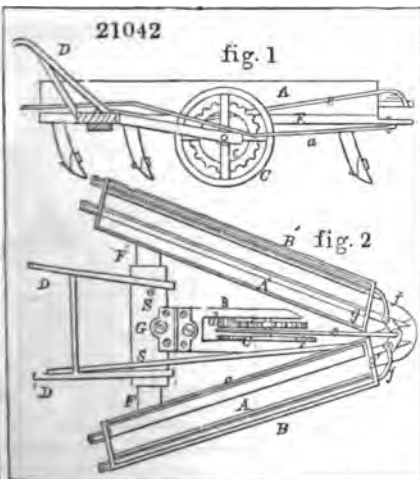
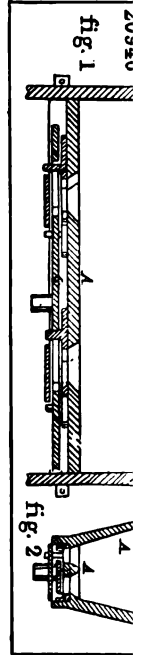
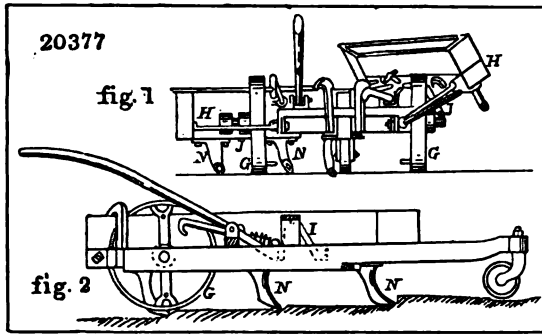
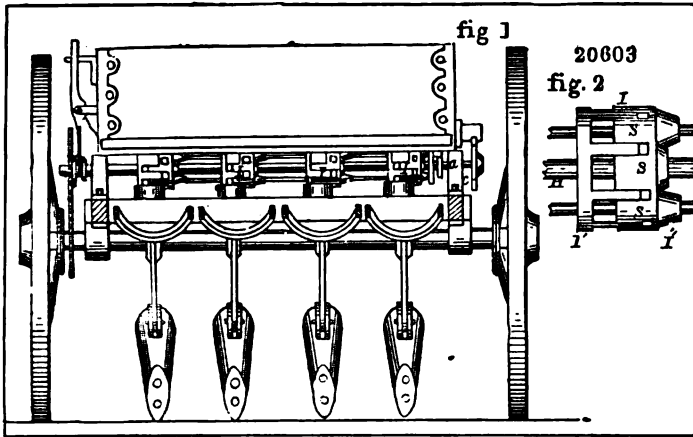


19808



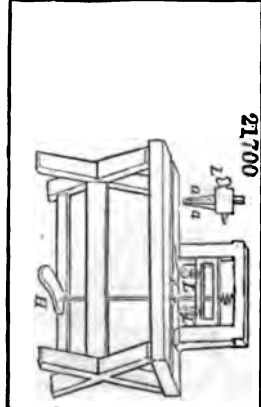
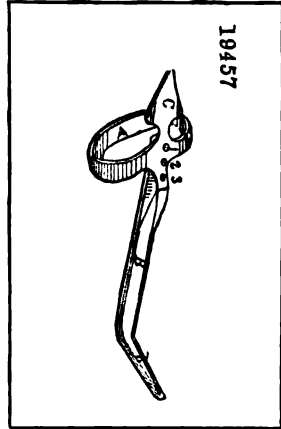
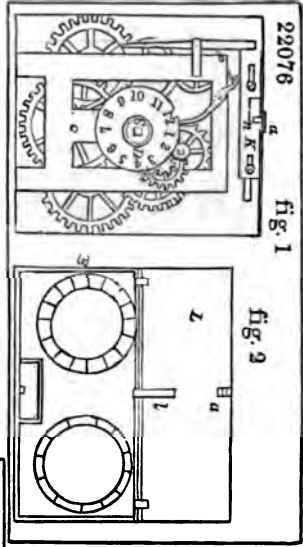
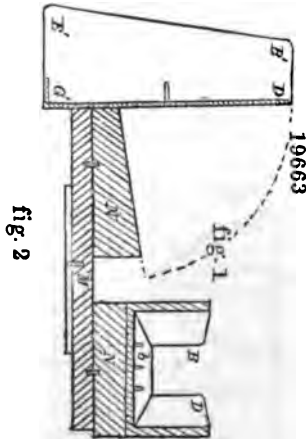
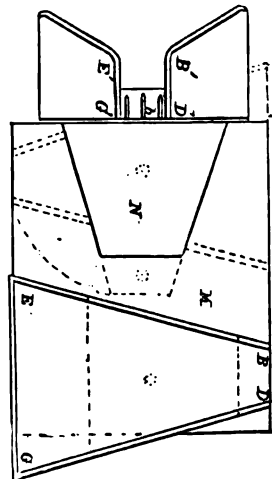
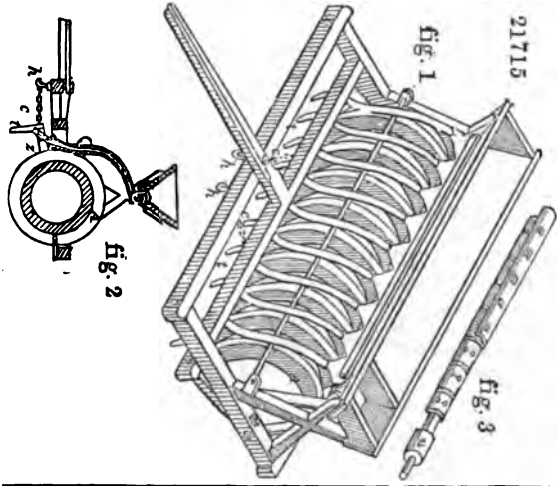
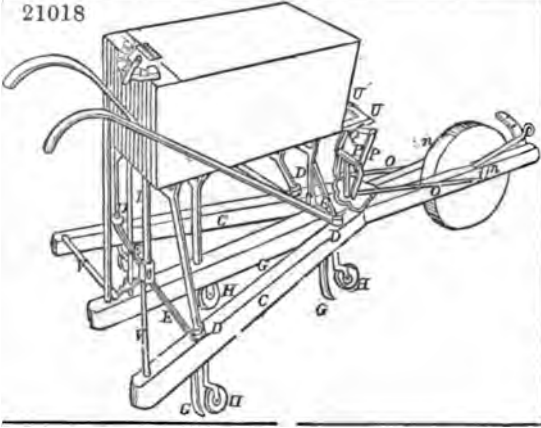
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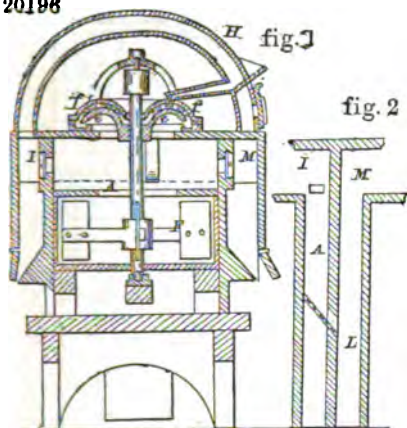




21018



20196



20899

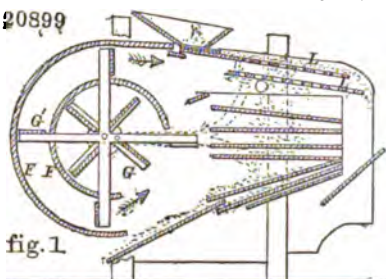
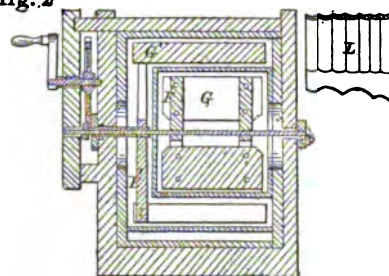


fig. 2



20581

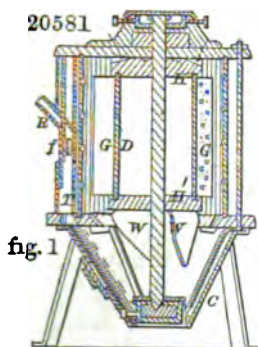
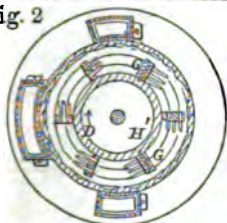
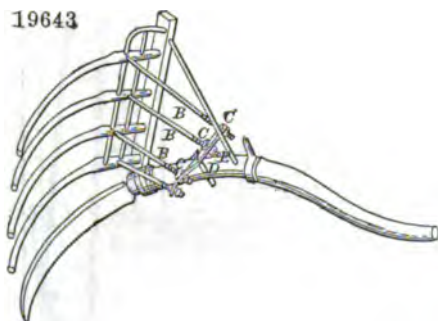


fig. 1

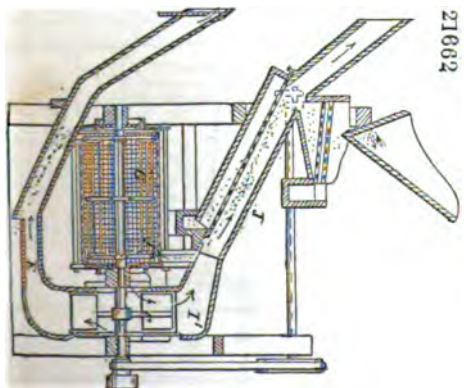
fig. 2



19643



21662



20425

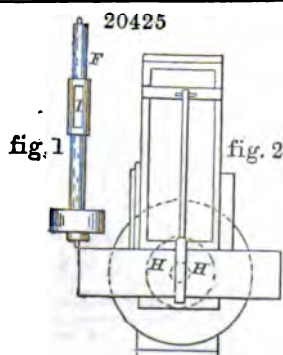
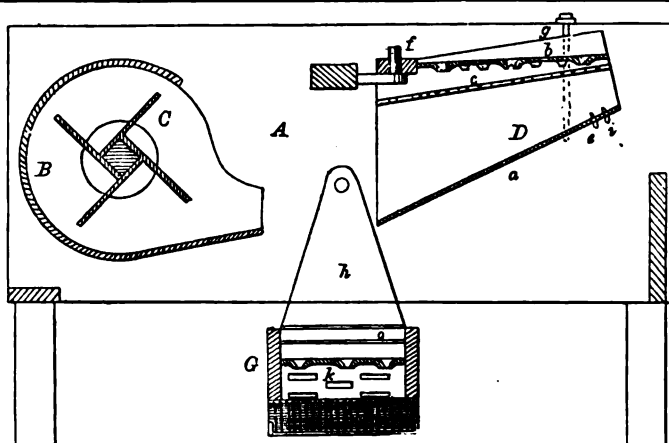


fig. 1

fig. 2

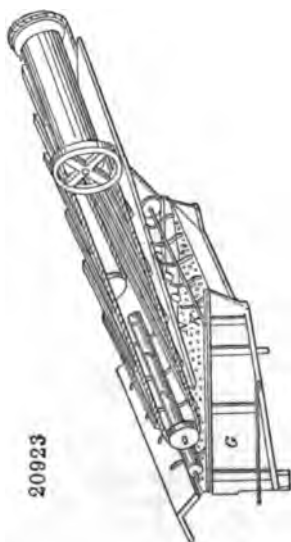
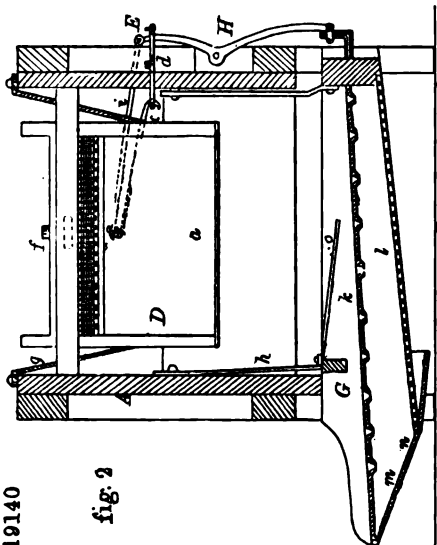
19140

fig. 1



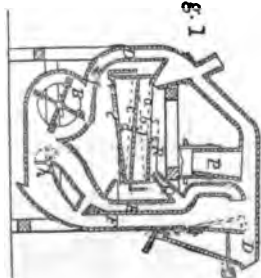
19140

fig. 2



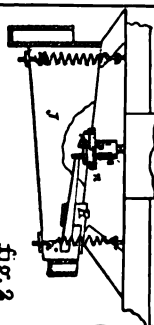
20923

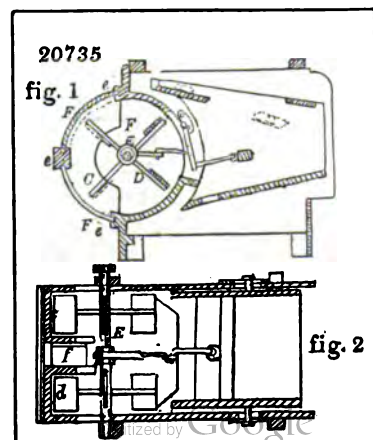
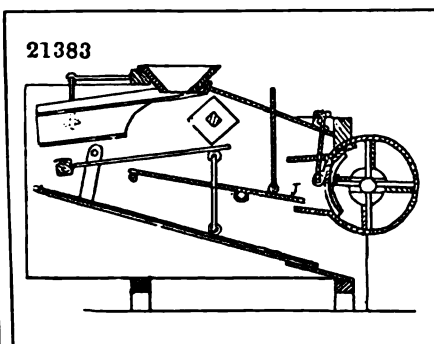
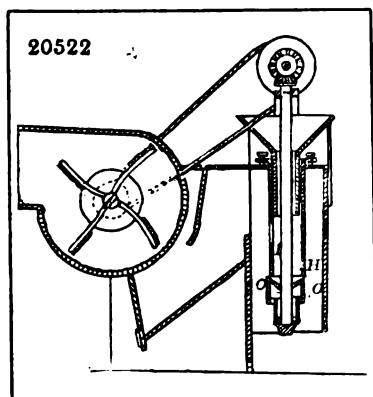
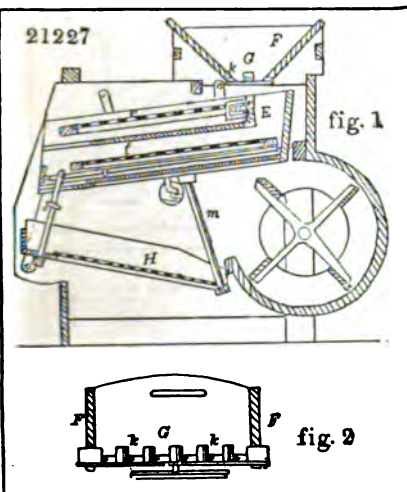
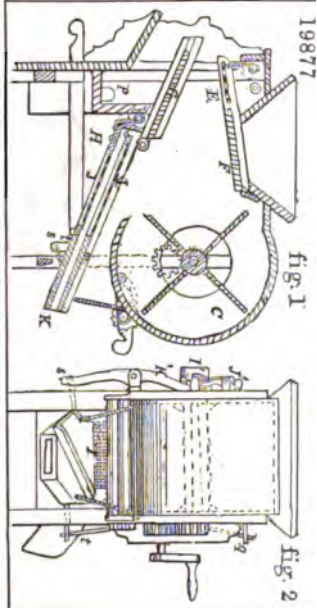
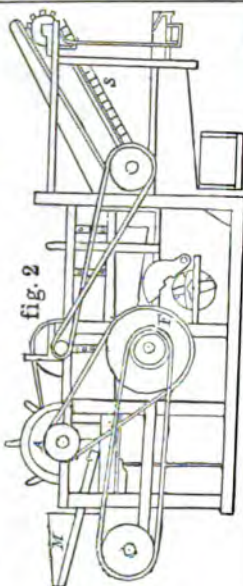
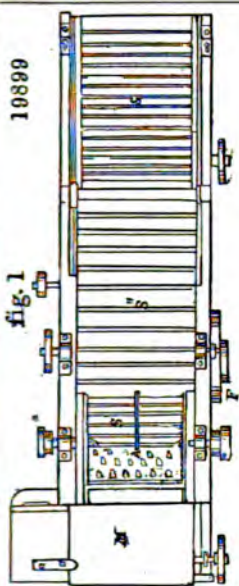
fig. 1

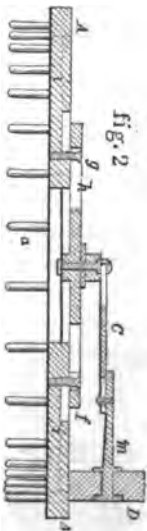
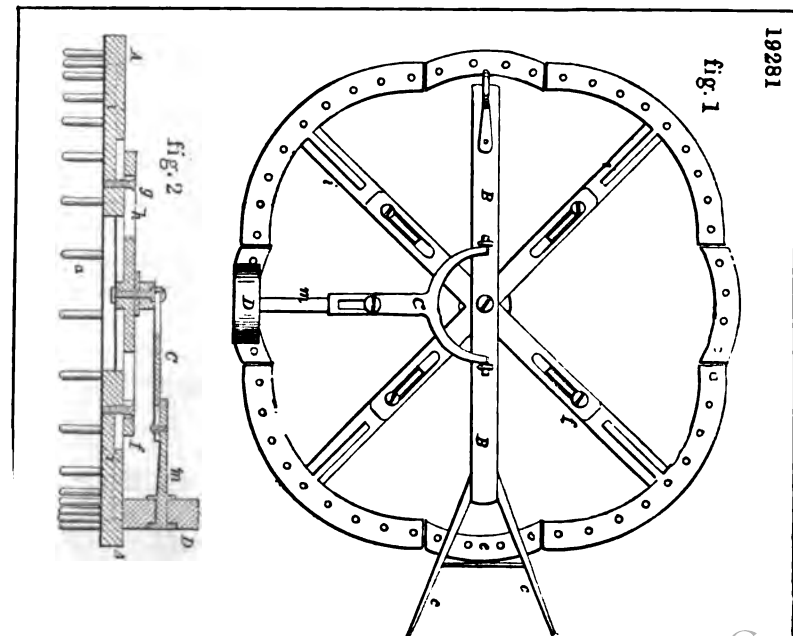
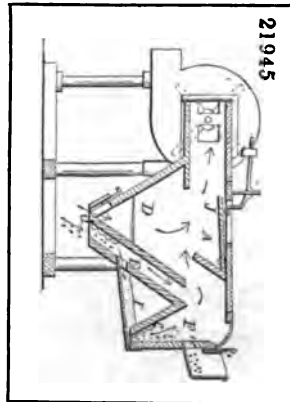
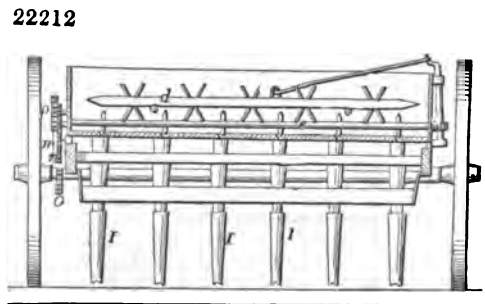
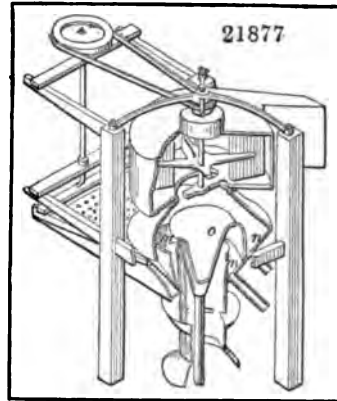
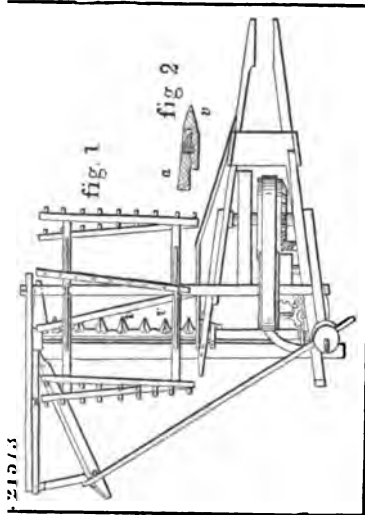


21036

fig. 2







19259

fig. 1

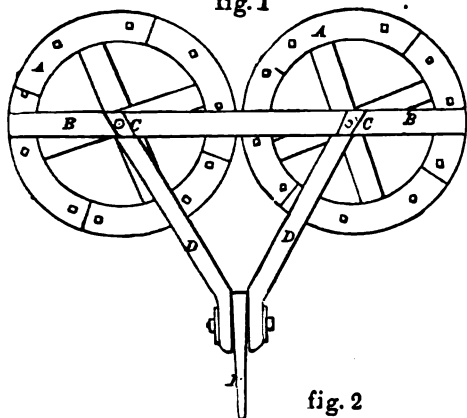
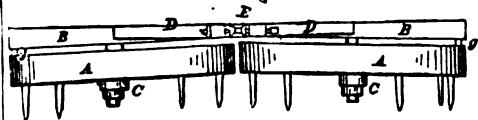
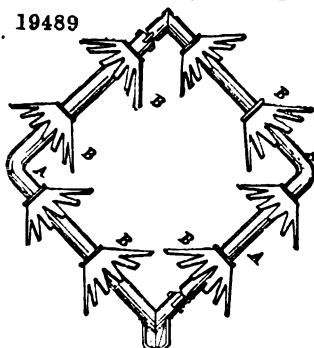


fig. 2



19489



20195

fig. 1

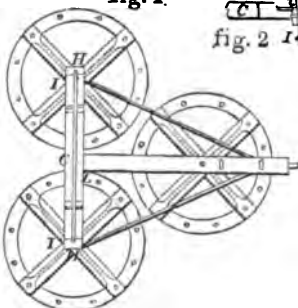
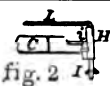
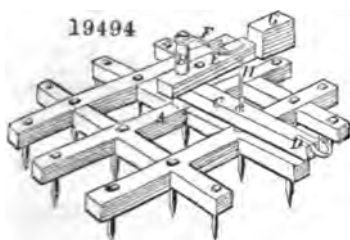


fig. 2



19494



20325

fig. 1

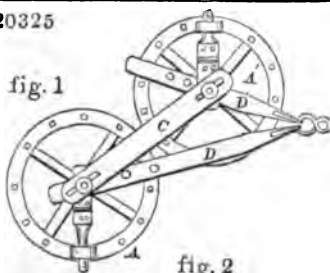
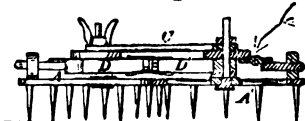


fig. 2



21113

fig. 1

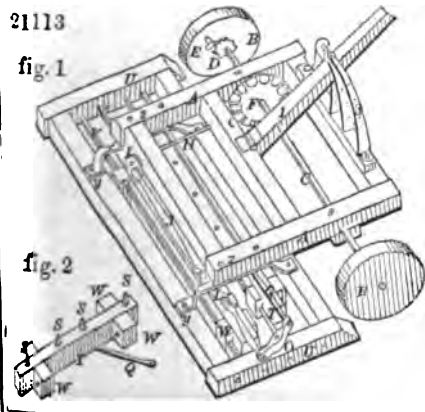


fig. 2



fig. 1

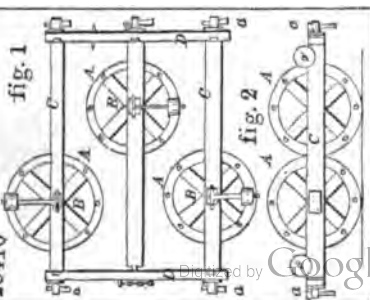


fig. 2



20410



21153

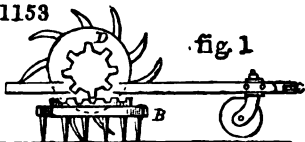


fig. 1

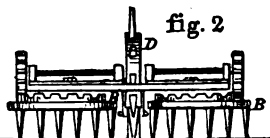


fig. 2

21269

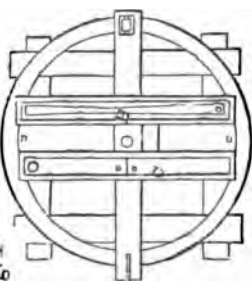


fig. 1

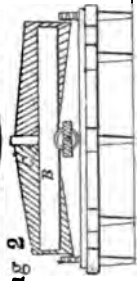


fig. 2

21403

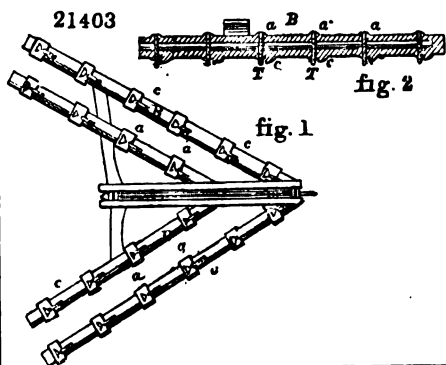
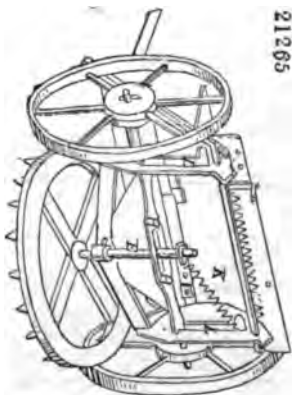


fig. 1

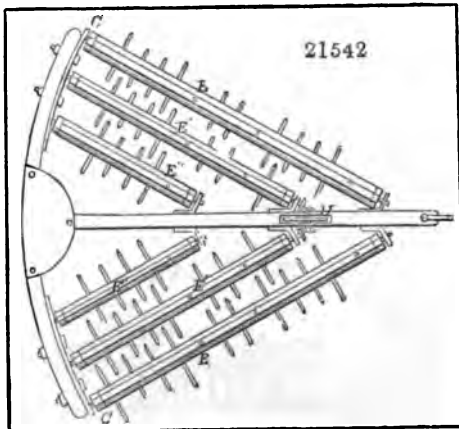


fig. 2

21265



21542



19365



fig. 1

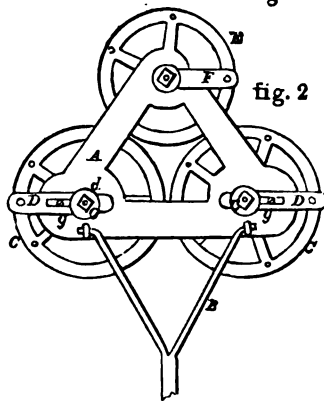


fig. 2

21439

fig. 1

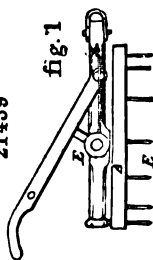
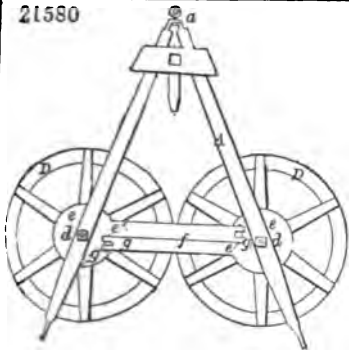


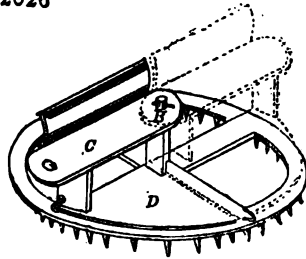
fig. 2



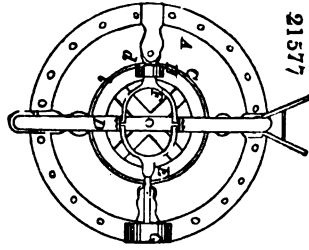
21580



22026



21577



19137

fig 1

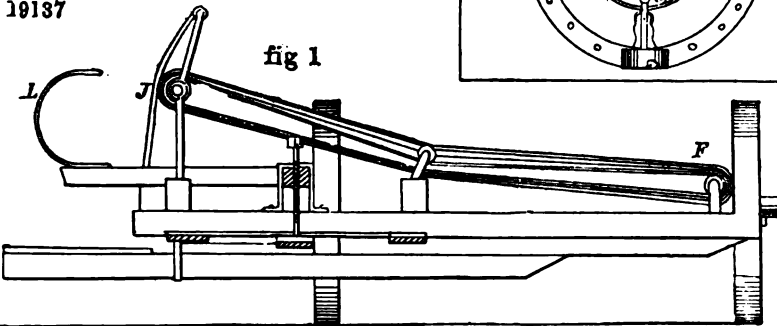


fig. 2

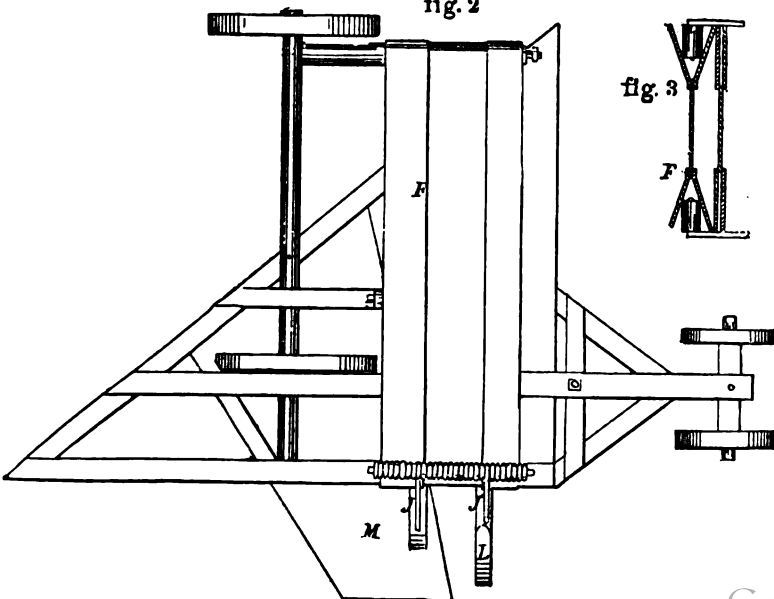
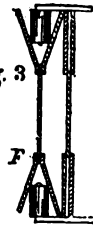
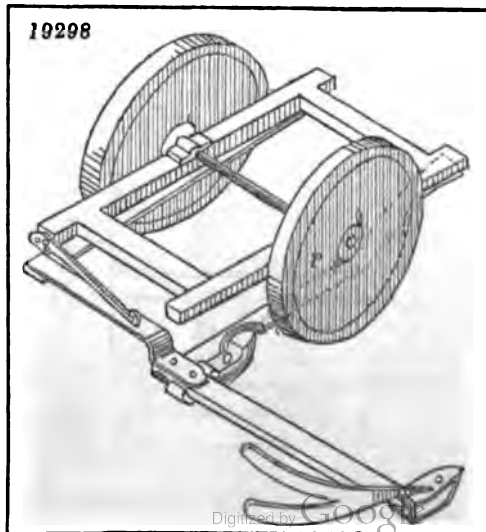
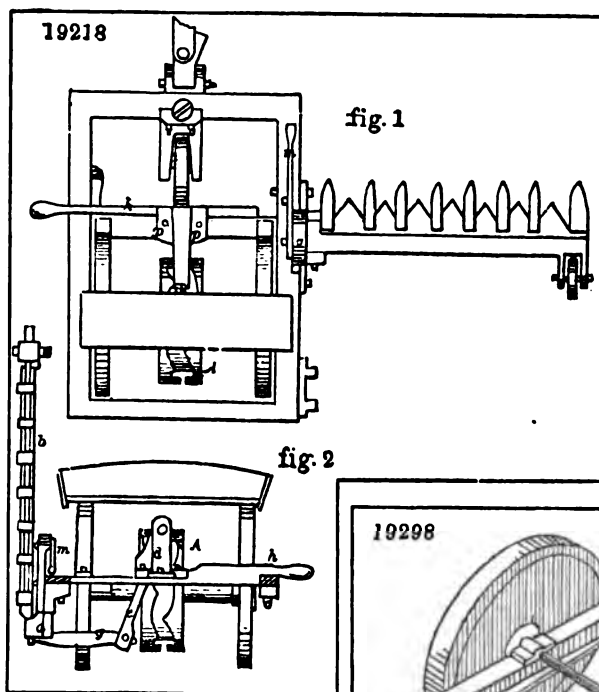
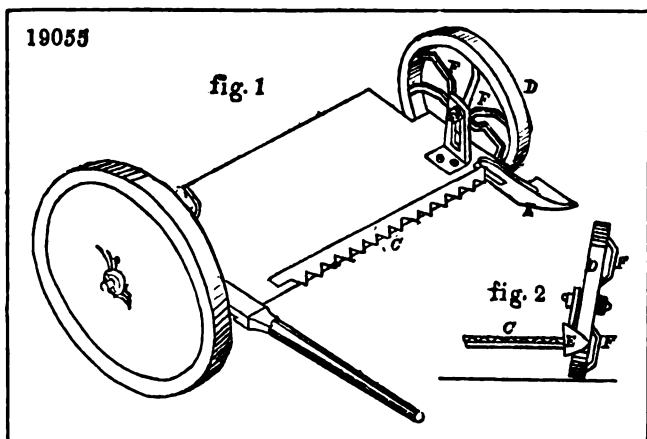


fig. 3







19377

fig. 1

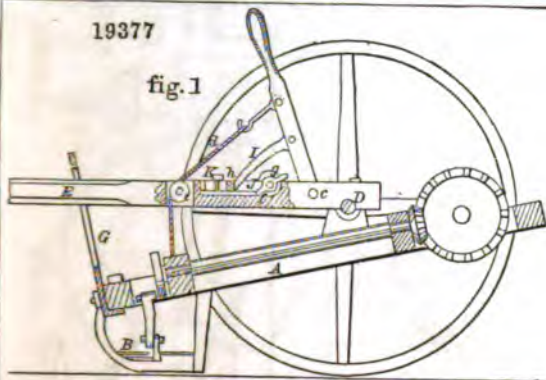
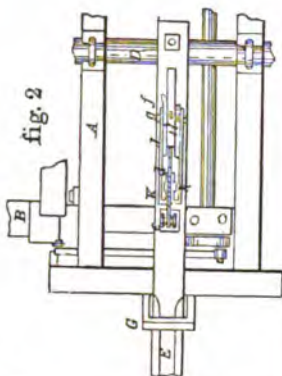


fig. 2



19447

fig. 1

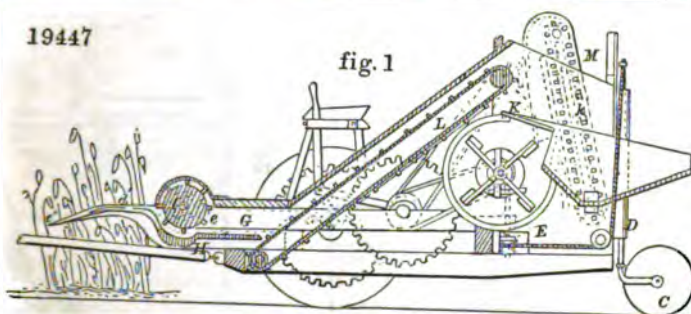
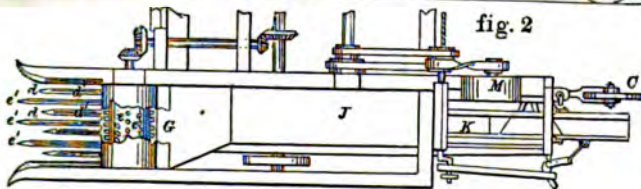
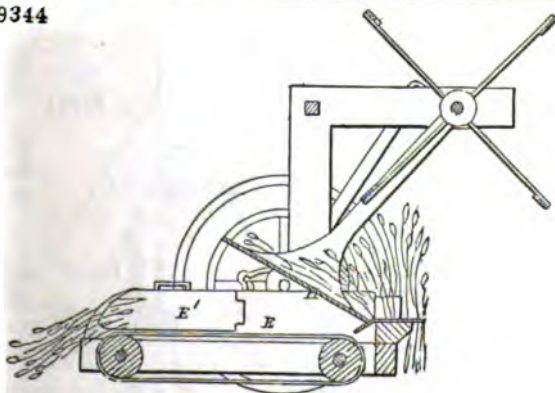
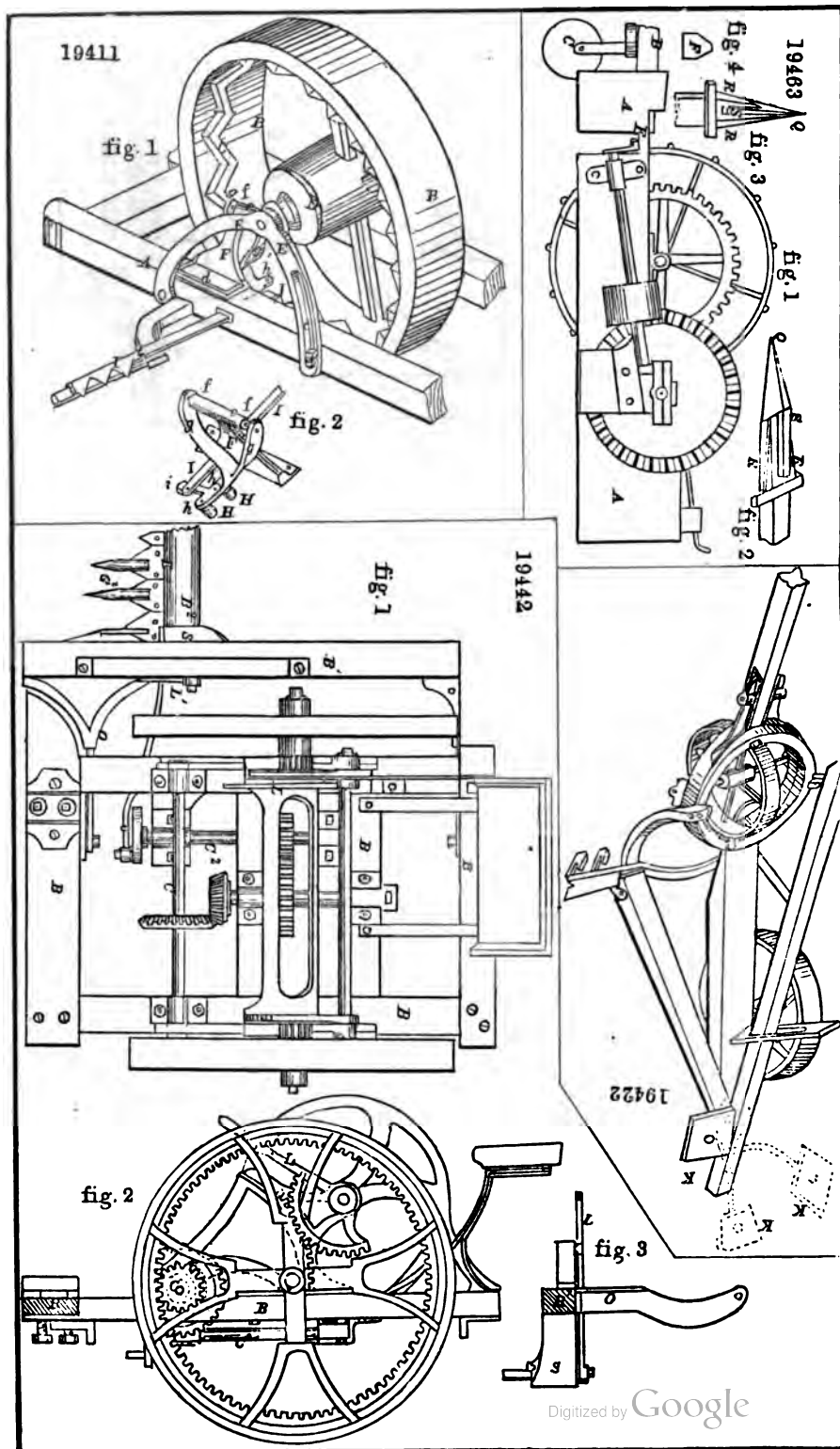


fig. 2



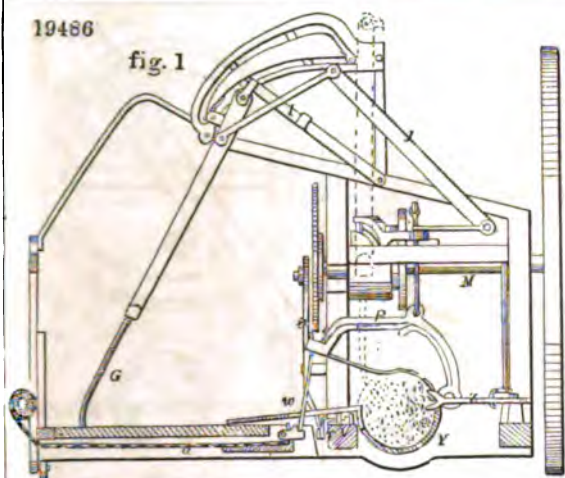
19344





19486

fig. 1



19522

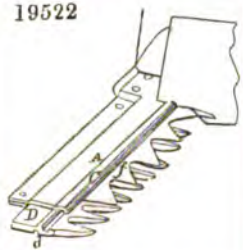
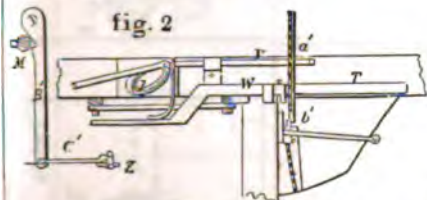


fig. 2



19483



fig. 1

fig. 2

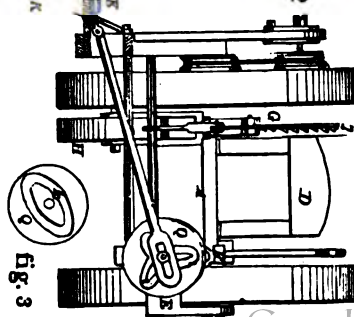


fig. 3

19590

fig. 1

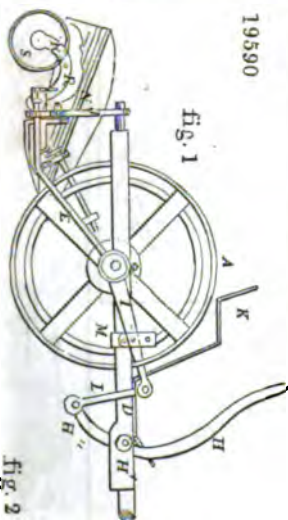
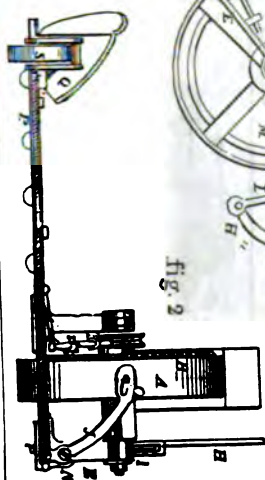


fig. 2





19703

fig. 1

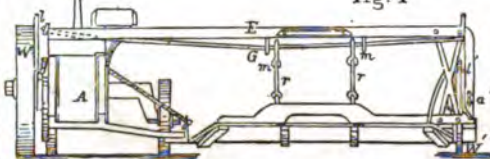
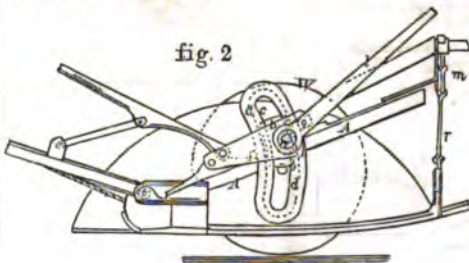


fig. 2



19803

fig. 1

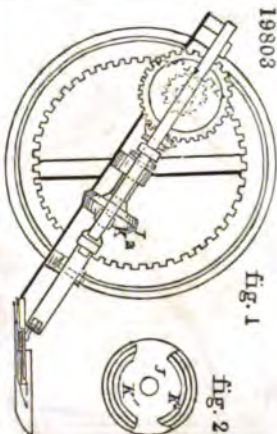


fig. 2



fig. 3



19749

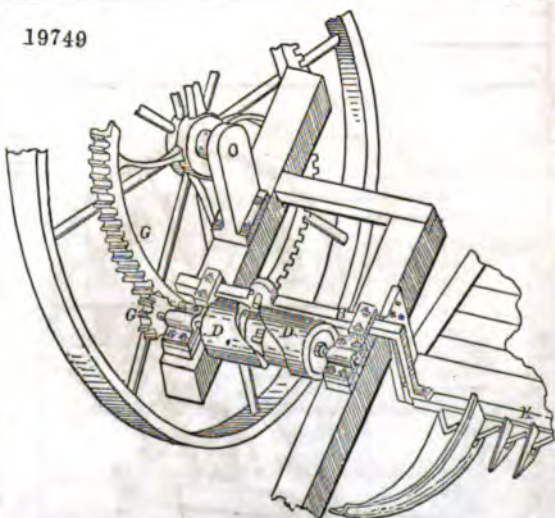


fig. 1

19884

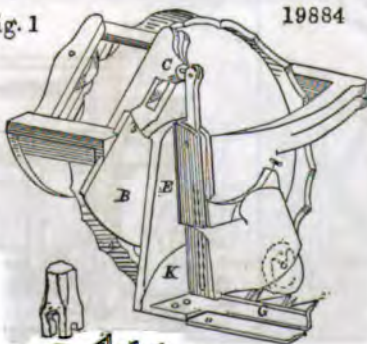


fig. 2



19864

fig. 1

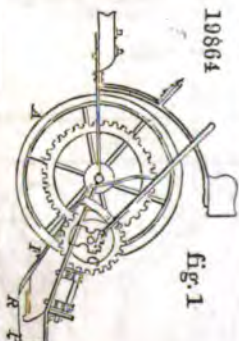
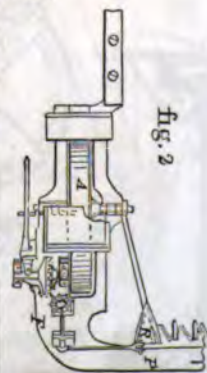


fig. 2



19999

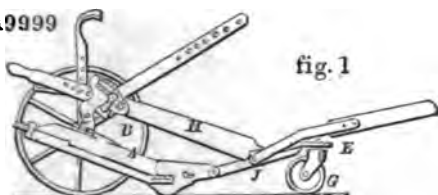


fig. 1

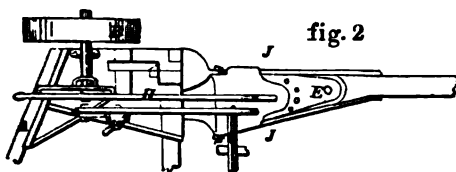


fig. 2

20080

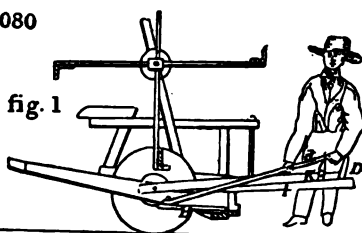


fig. 1

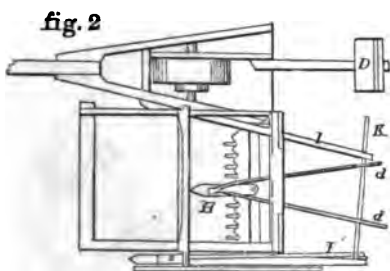


fig. 2

20180

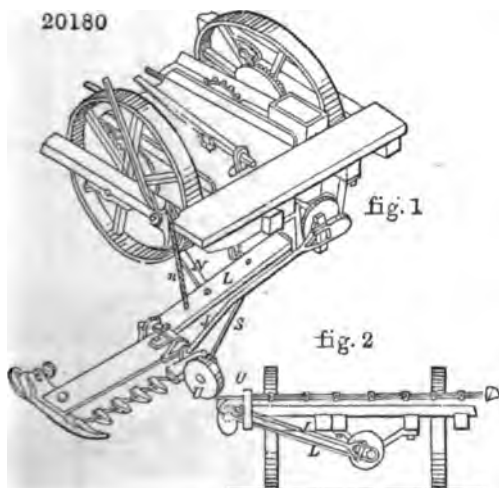


fig. 1

fig. 2

20050  
fig. 1

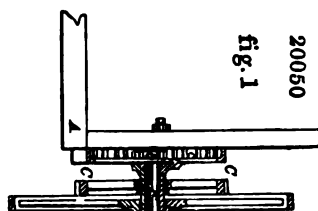
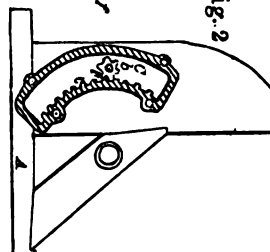


fig. 2



20181

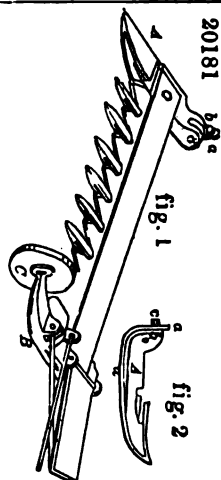


fig. 1

fig. 2

20182

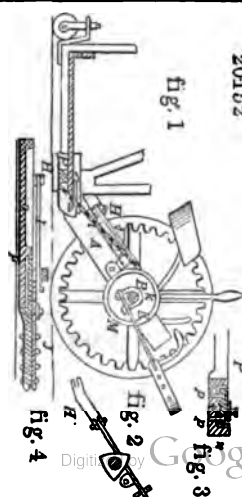
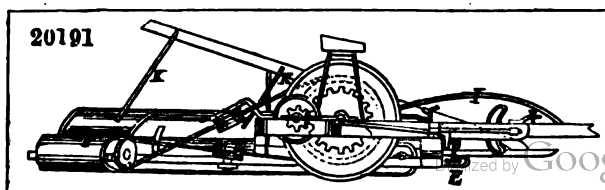
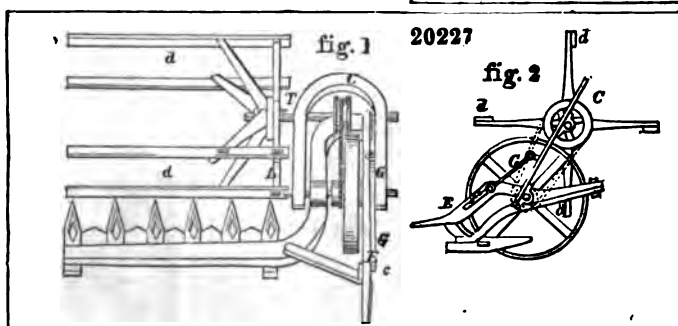
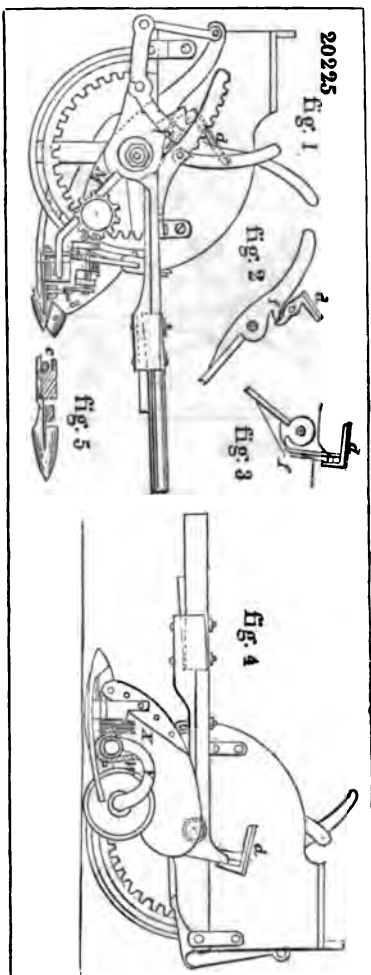
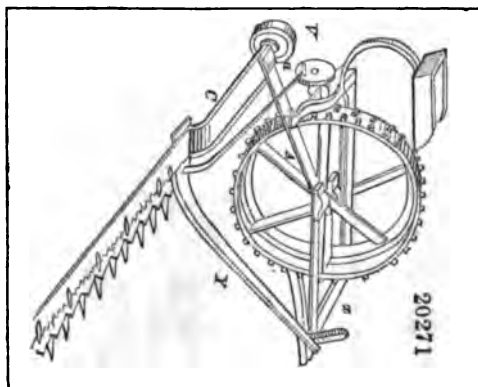
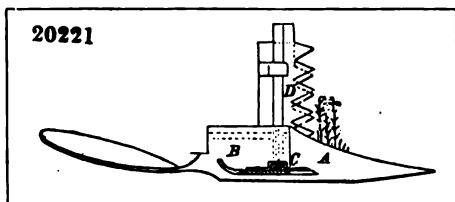
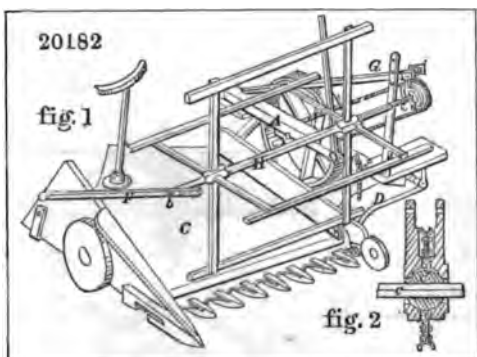


fig. 1

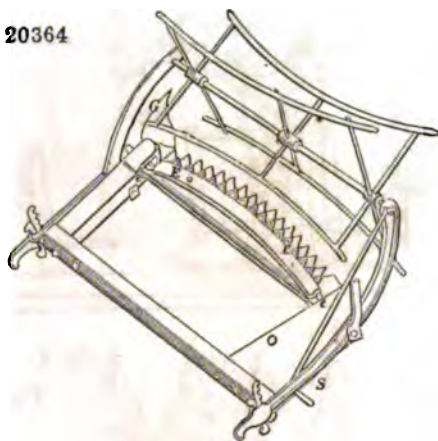
fig. 4

fig. 3

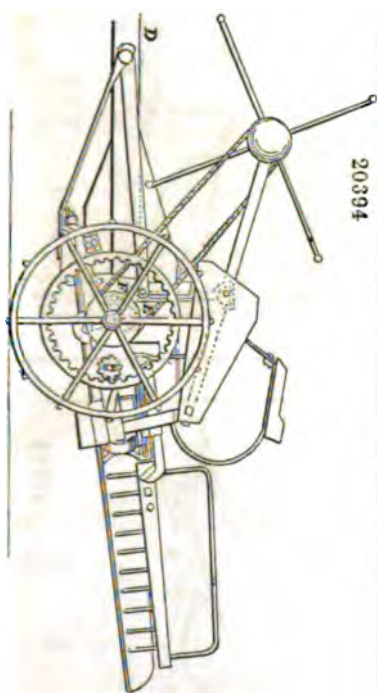
Digitized by Google



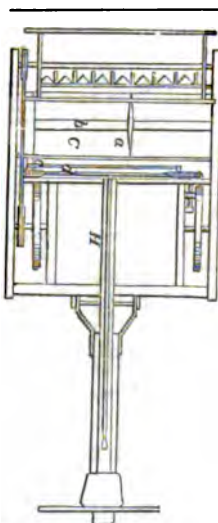
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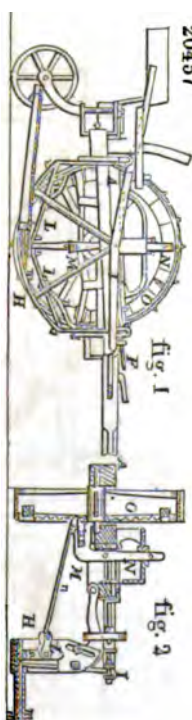
20394



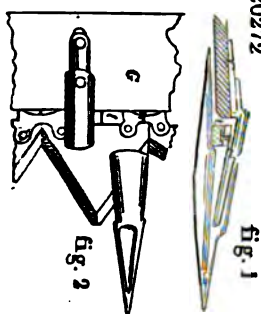
20525



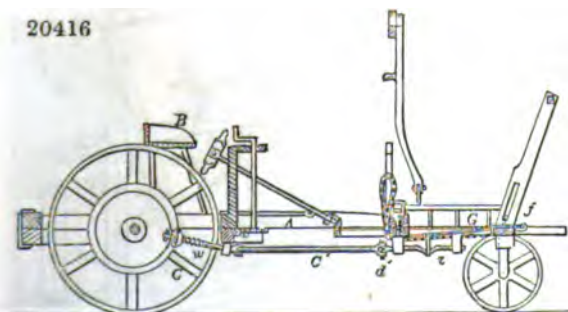
20457



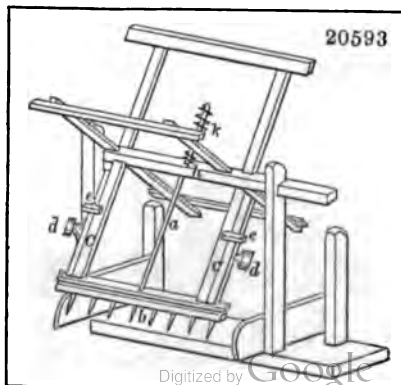
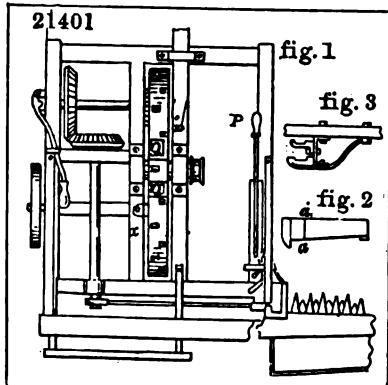
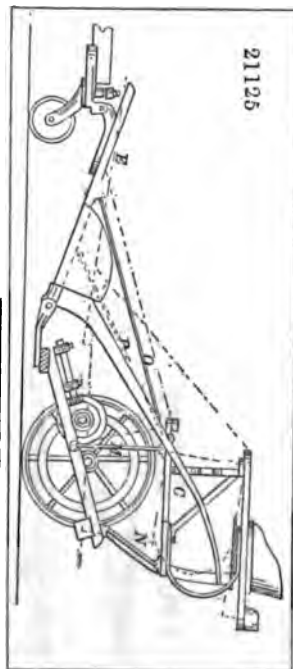
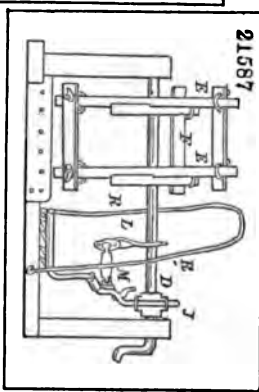
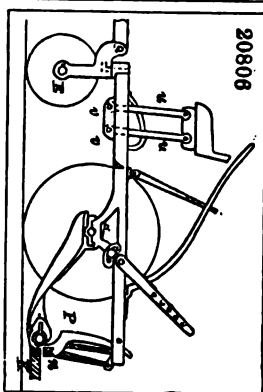
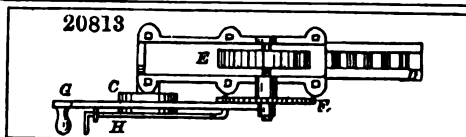
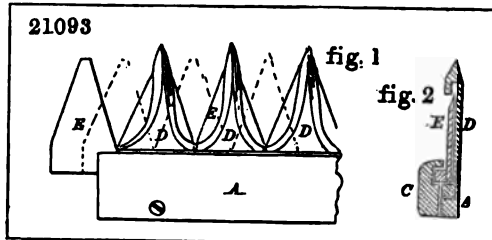
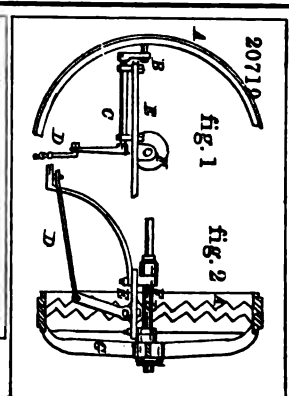
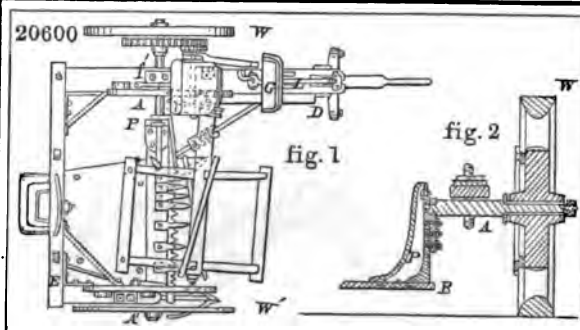
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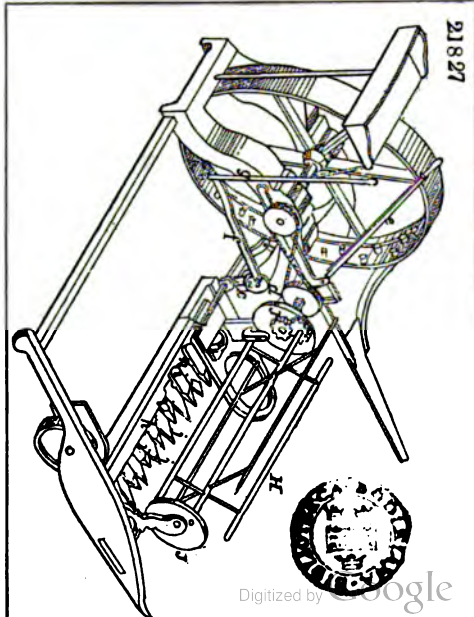
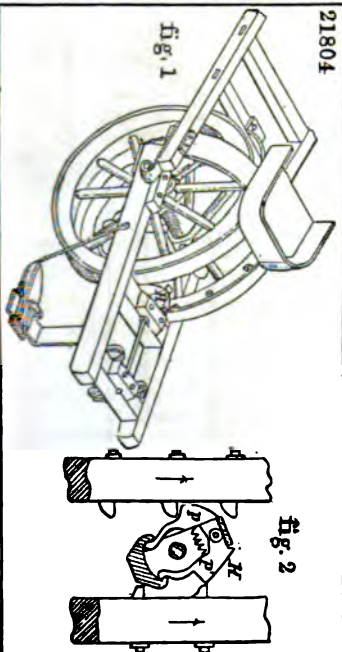
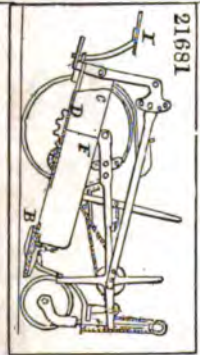
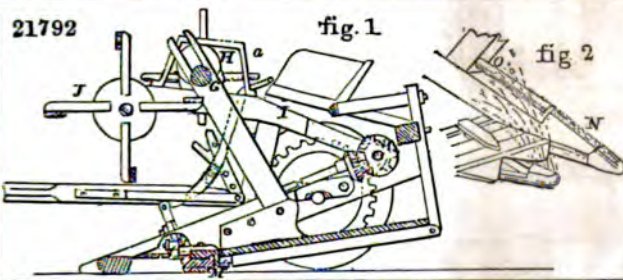
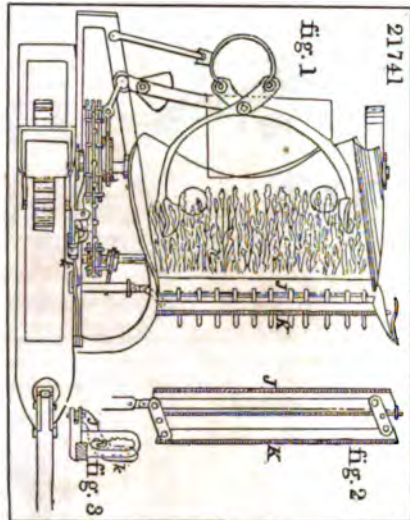
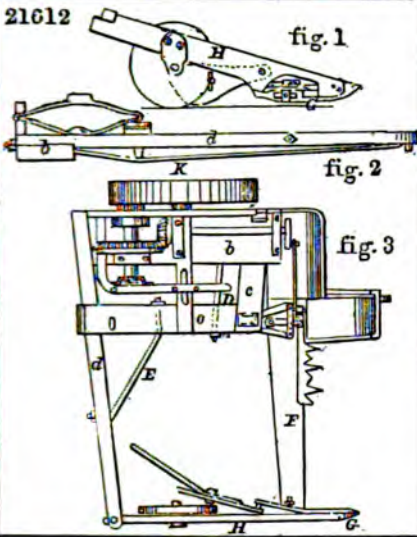


20416





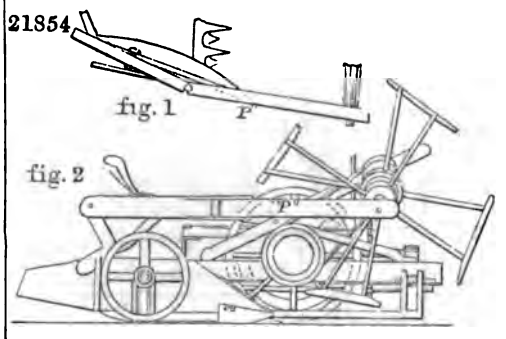




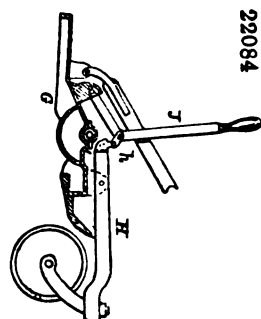
21854

fig. 1

fig. 2



22084

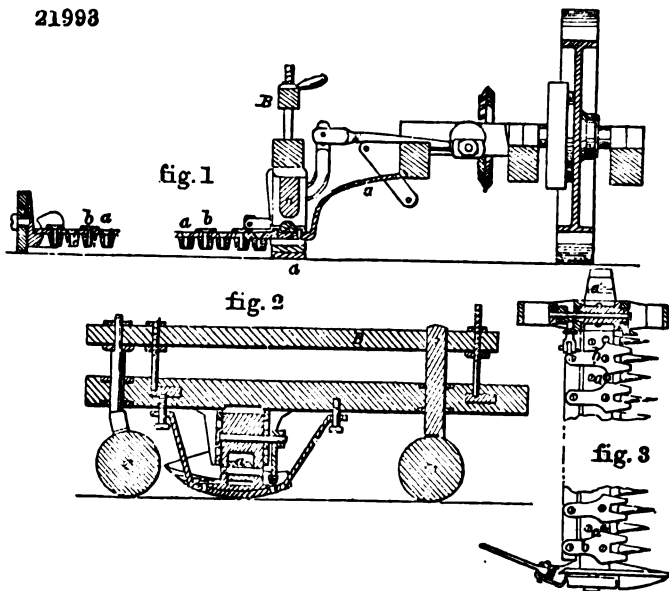


21993

fig. 1

fig. 2

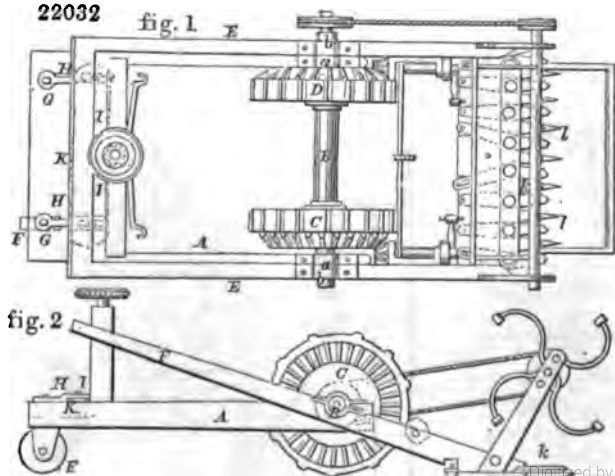
fig. 3



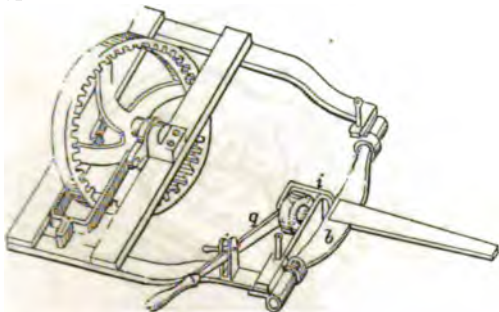
22032

fig. 1

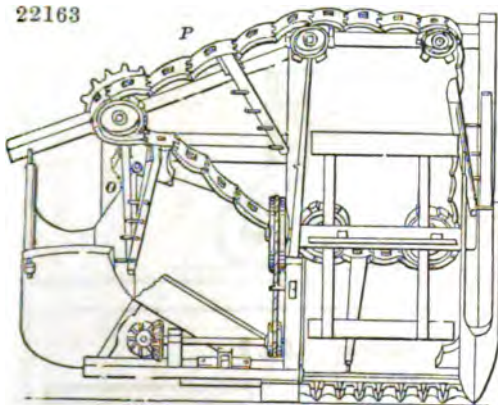
fig. 2



22077



22163



22237

fig. 1

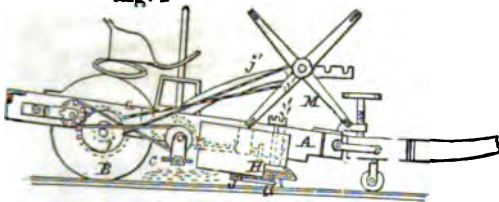
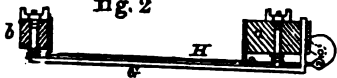
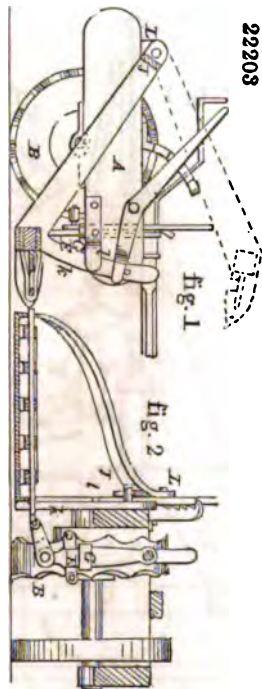


fig. 2



22203



22312

fig. 1

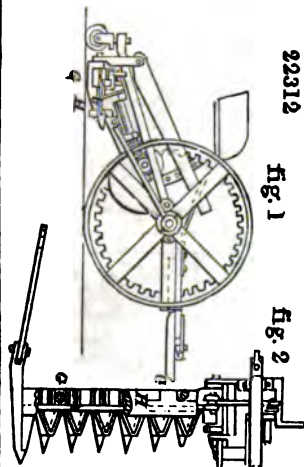


fig. 2

22345

fig. 1

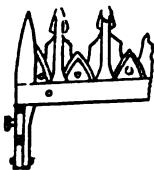
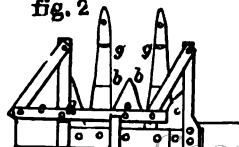


fig. 3



fig. 2

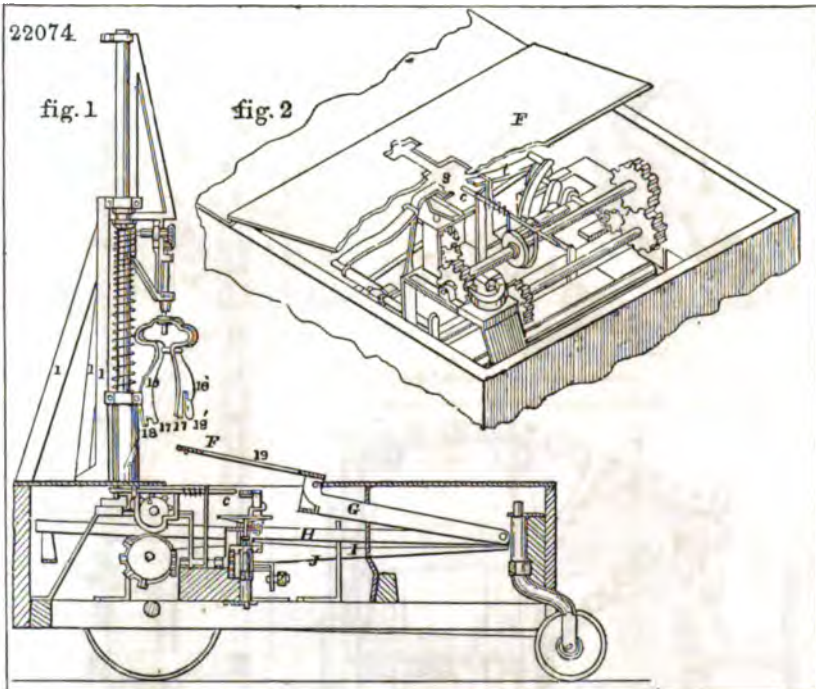




22074

fig. 1

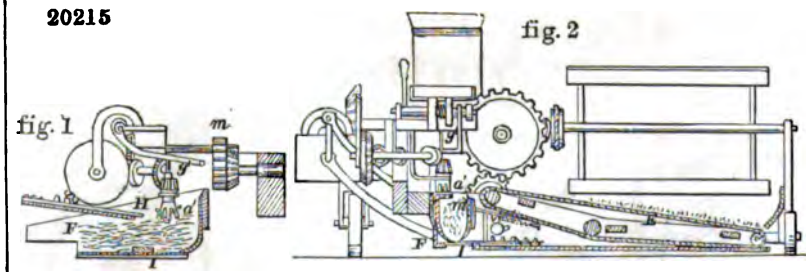
fig. 2



20215

fig. 2

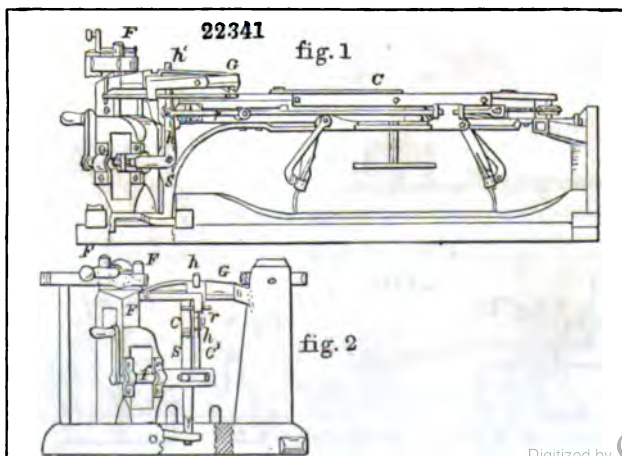
fig. 1



22341

fig. 1

fig. 2



19221

fig. 1

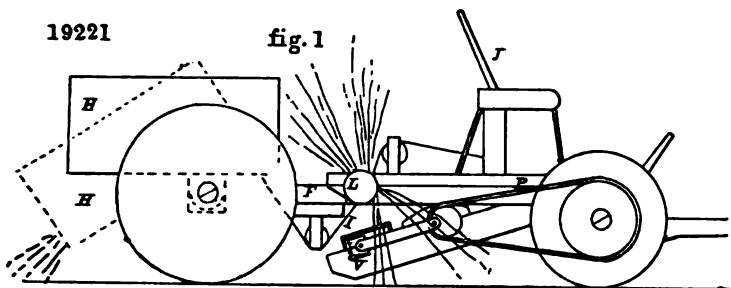
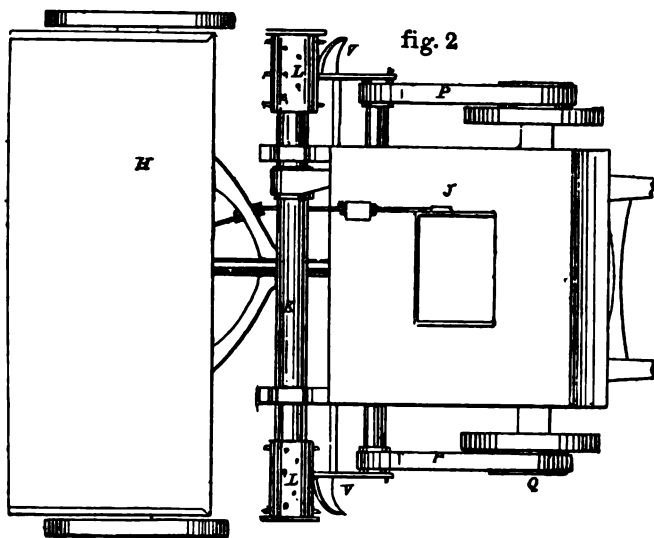


fig. 2



19716

fig. 1

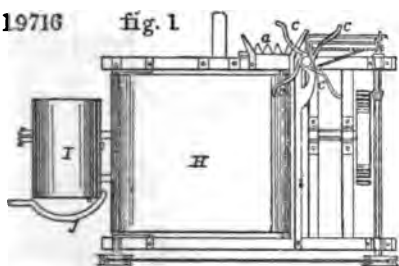
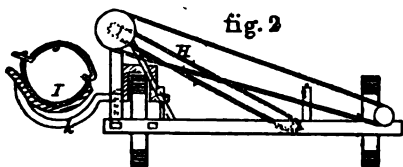
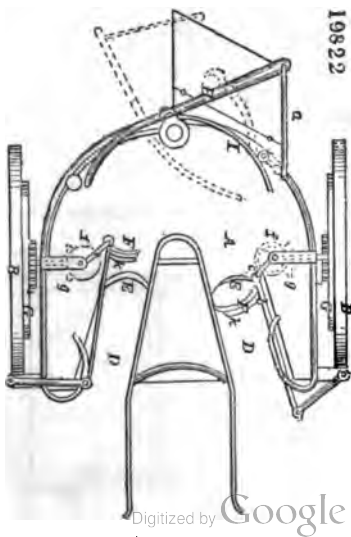


fig. 2



19822



20645

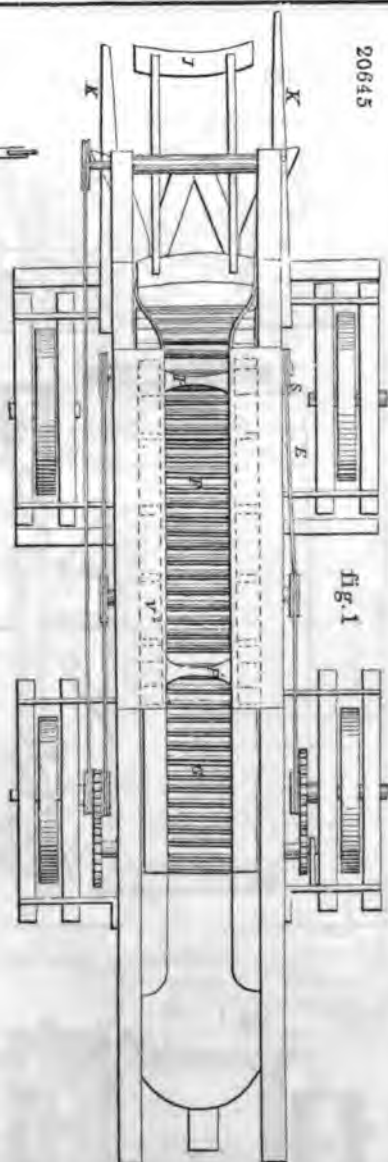
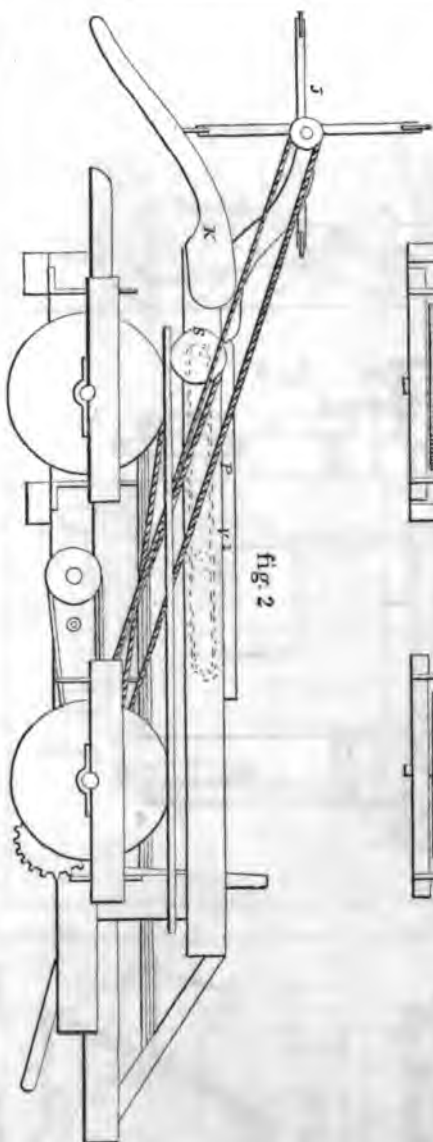
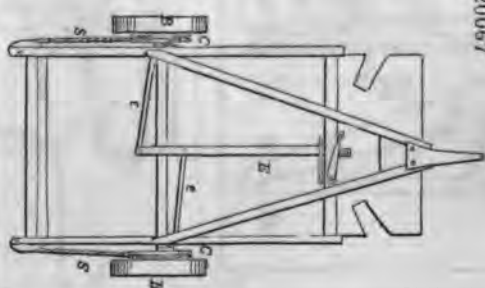


fig. 1

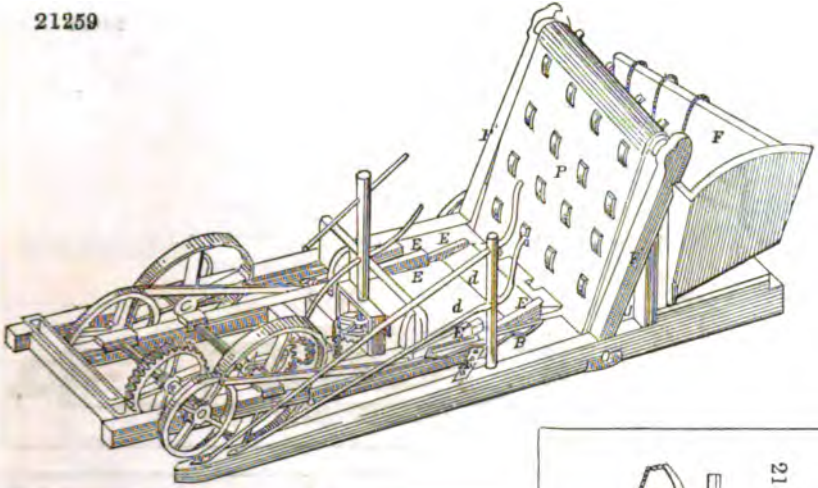
fig. 2



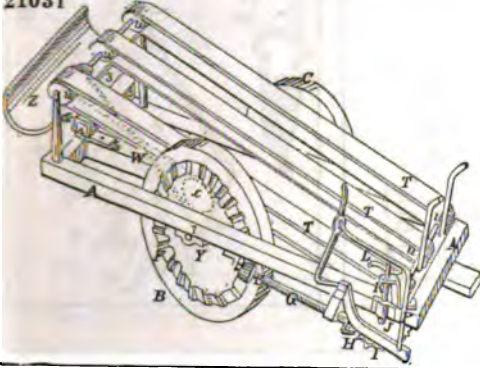
20067



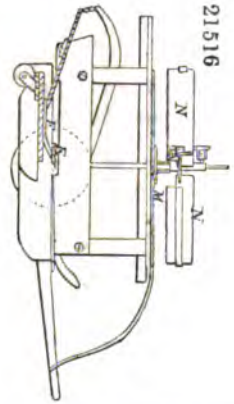
21259



21031



21516



20629

fig. 1

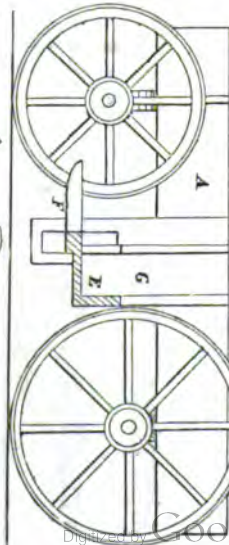
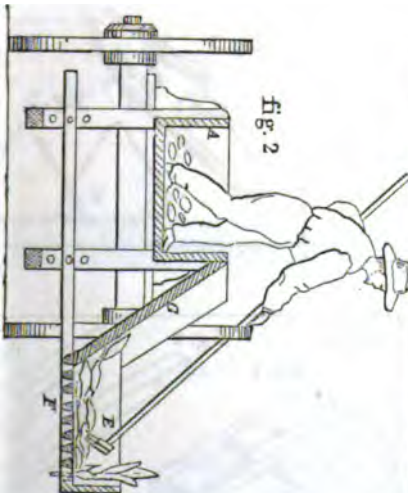
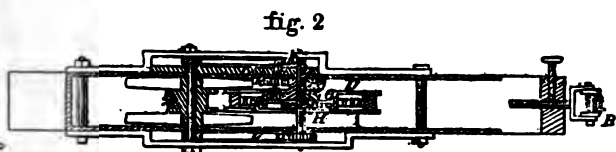
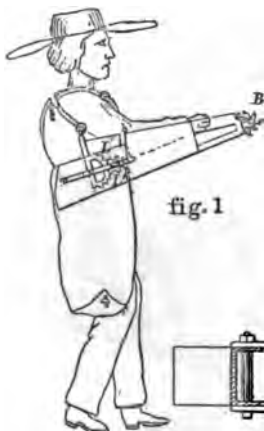


fig. 2





20066



19360

fig. 1



fig. 2



fig. 3

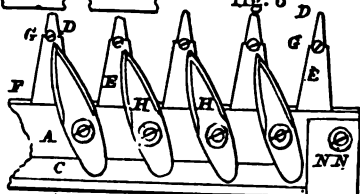
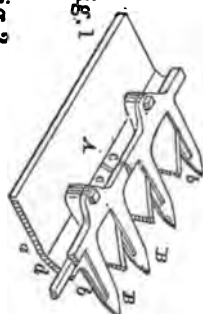


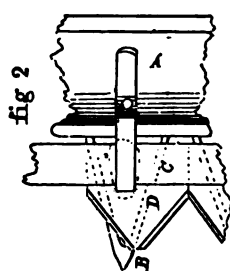
fig. 2



fig. 1



22468



21499

fig. 1

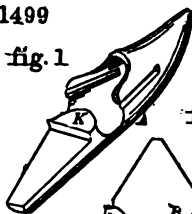
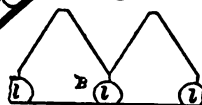
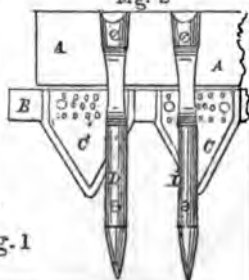


fig. 2



19920

fig. 2



20243

fig. 1

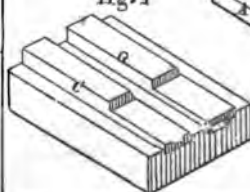


fig. 2

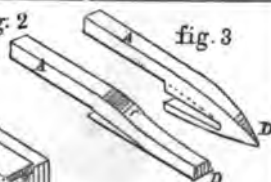
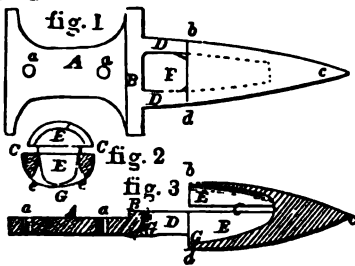
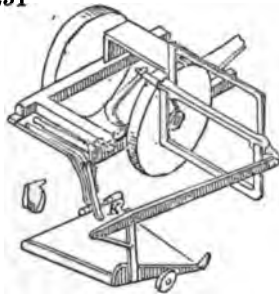


fig. 3

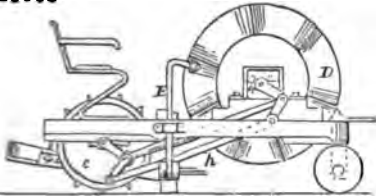
19518



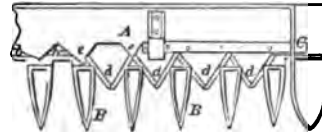
22251



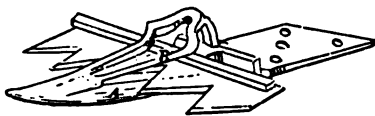
21063



19938



21538



20808

fig. 1

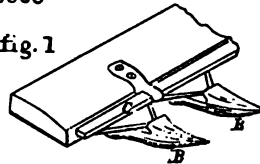


fig. 2



19319

fig. 1

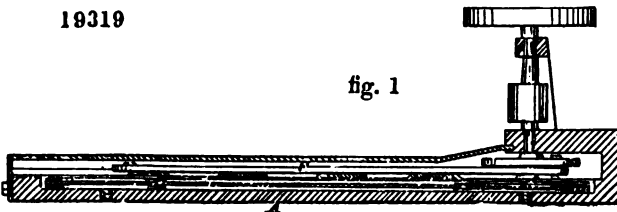
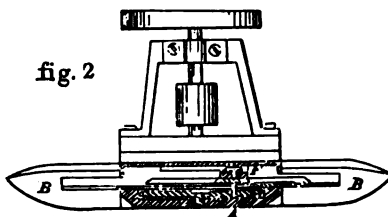
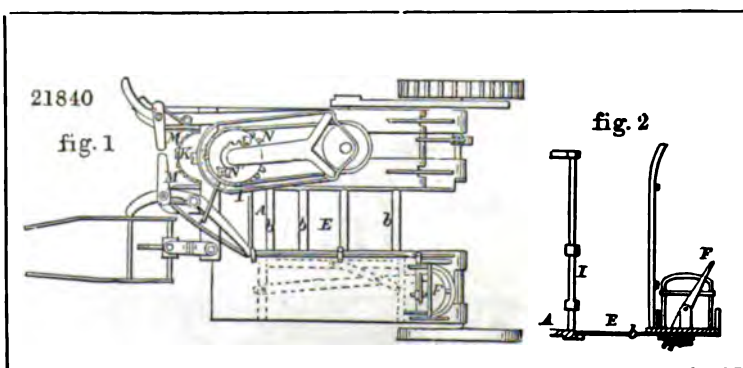
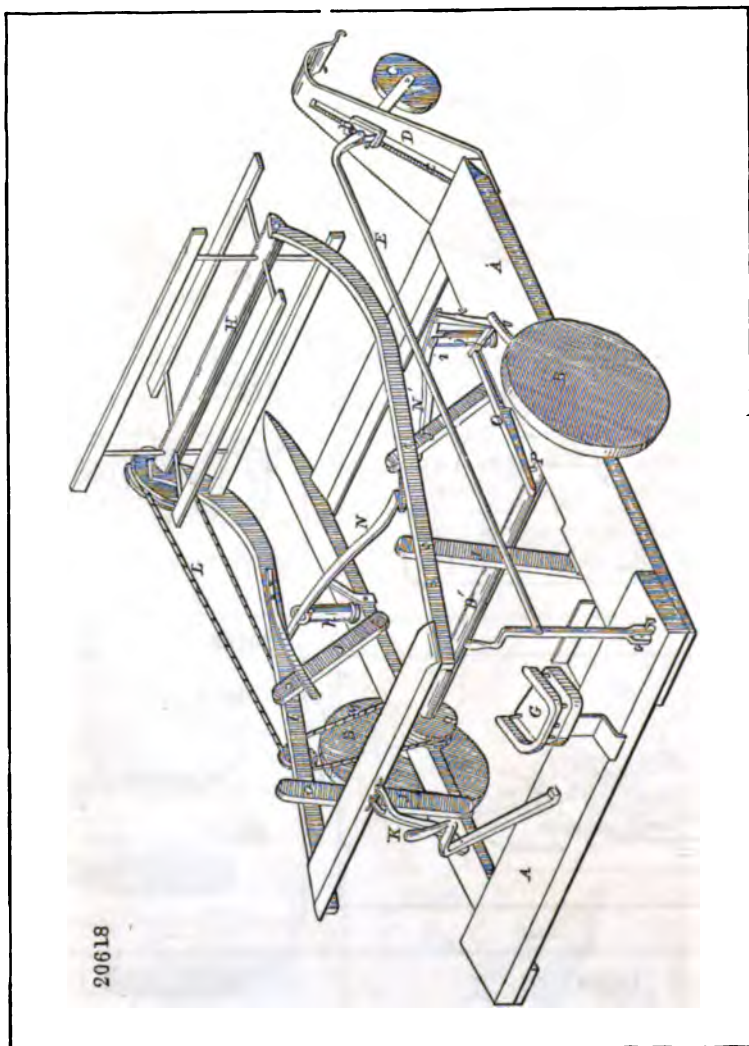


fig. 2





19523

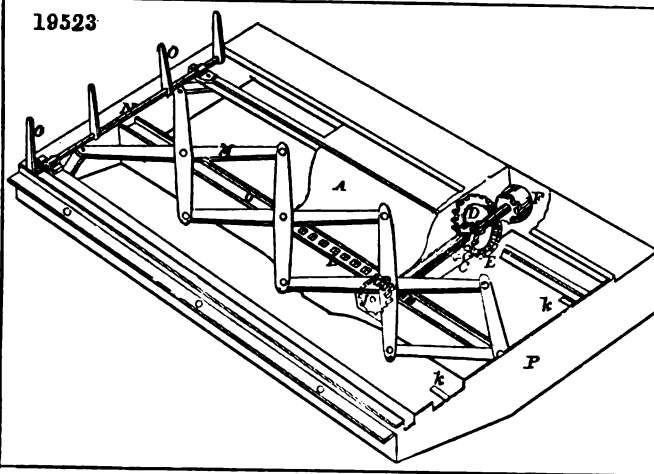


fig. 1

19019

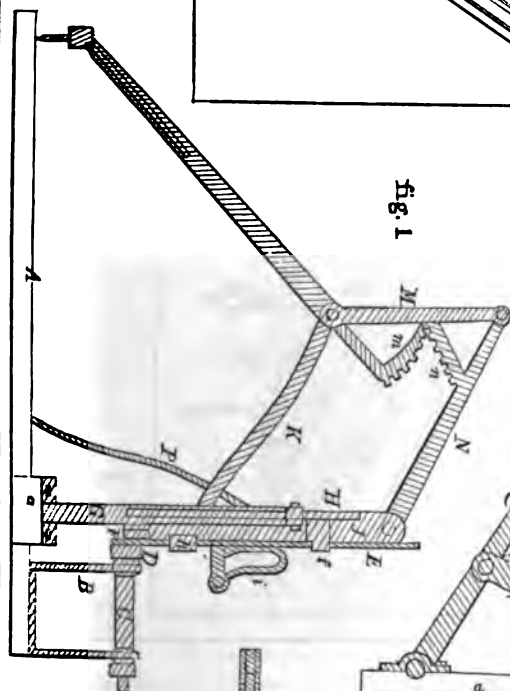


fig. 2

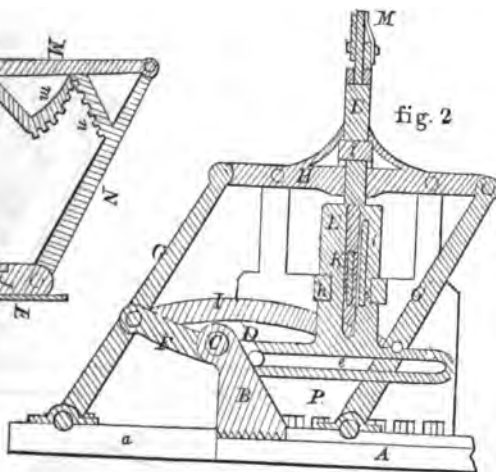
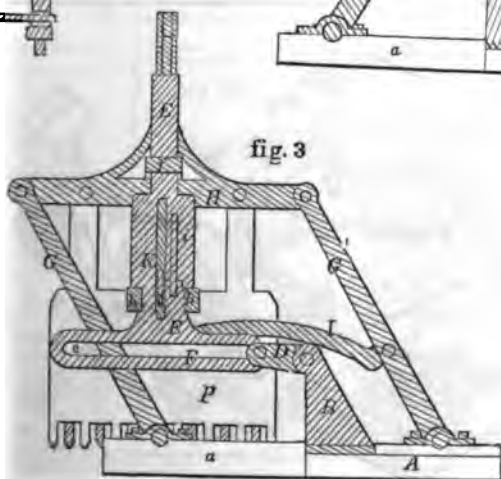
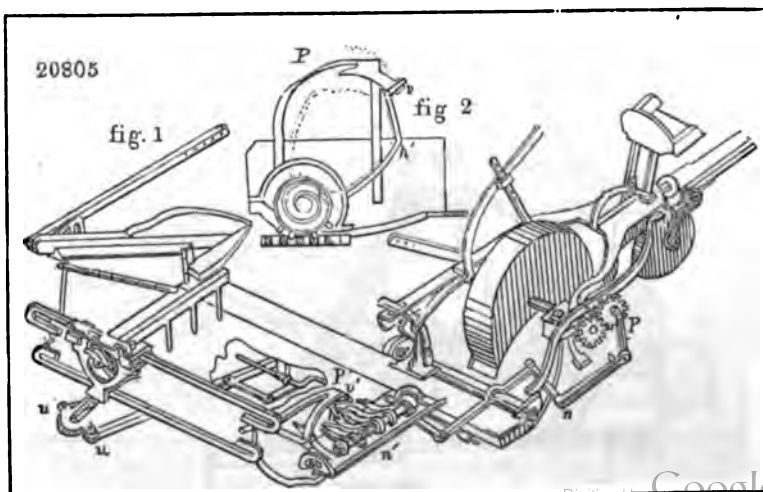
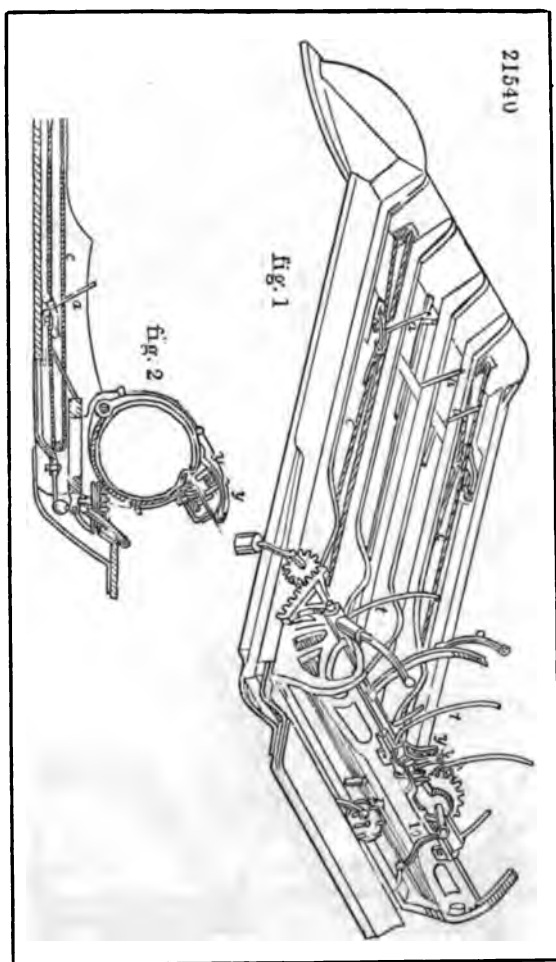


fig. 3





19212

fig 1

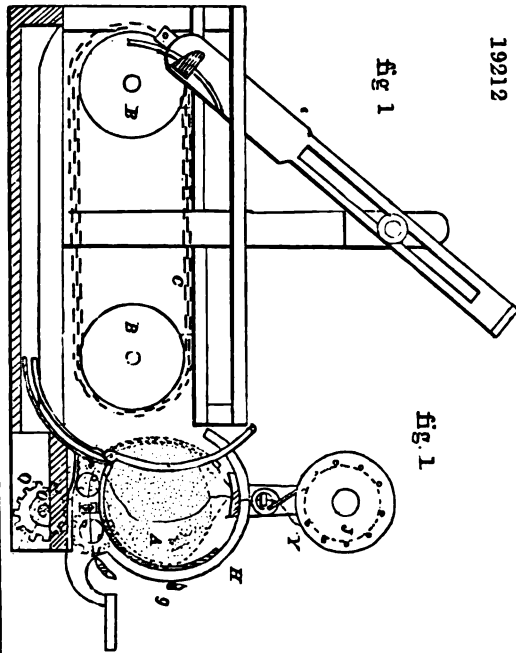


fig 1

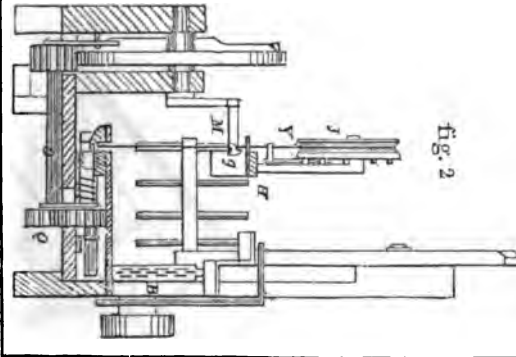
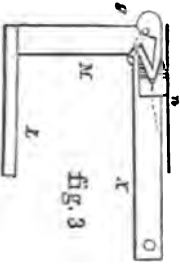


fig 2

fig 3



20119

fig 1

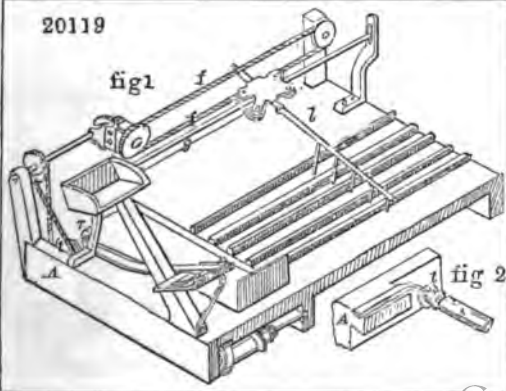
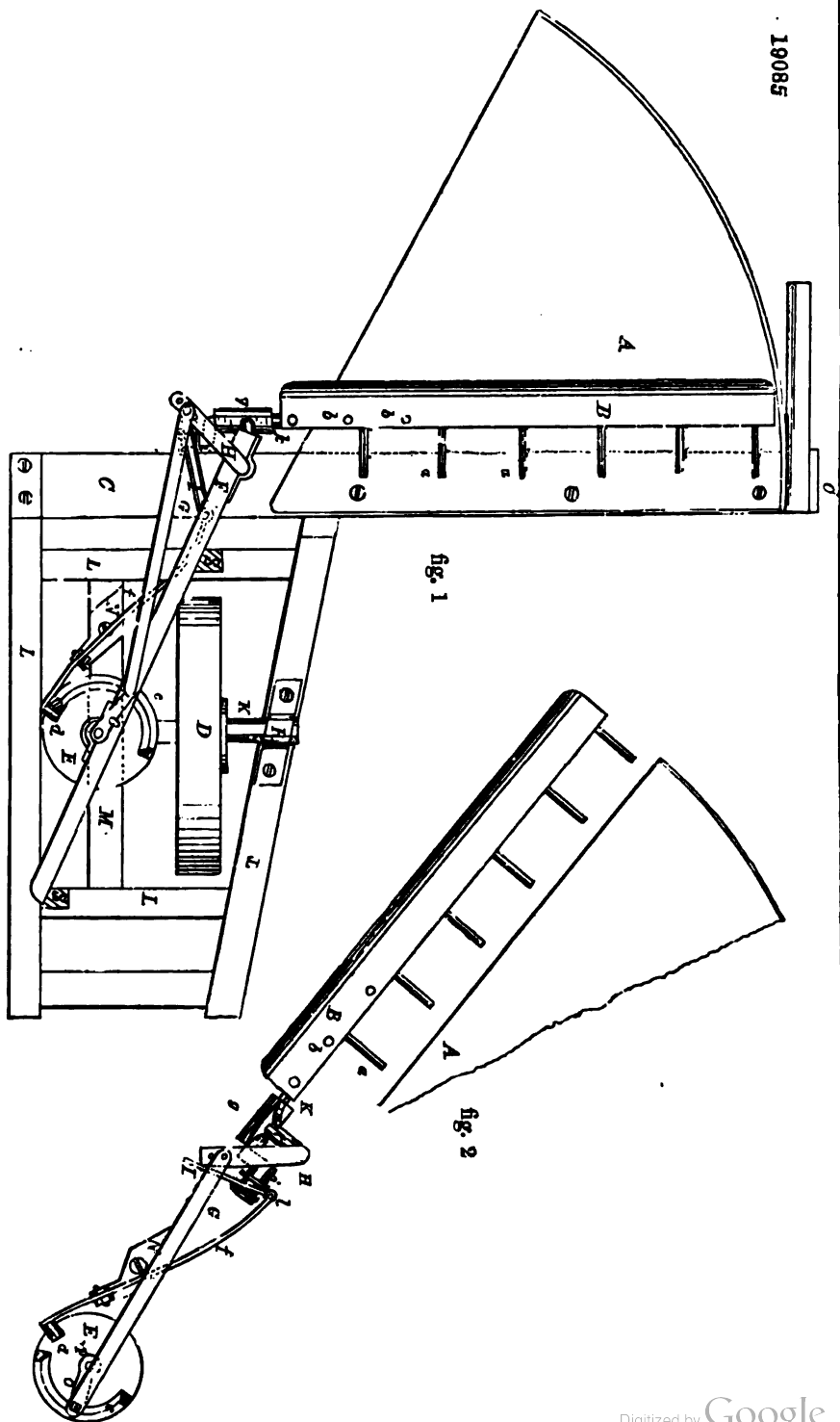
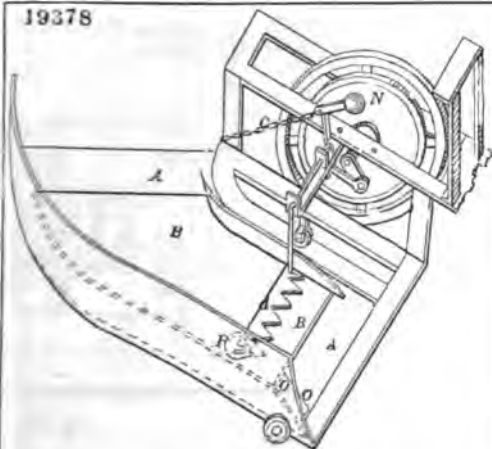


fig 2

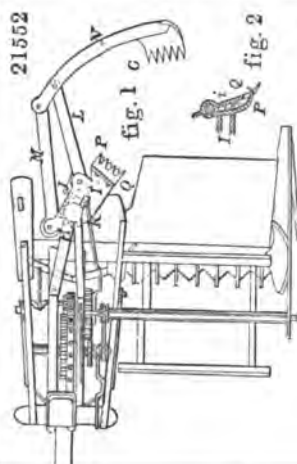
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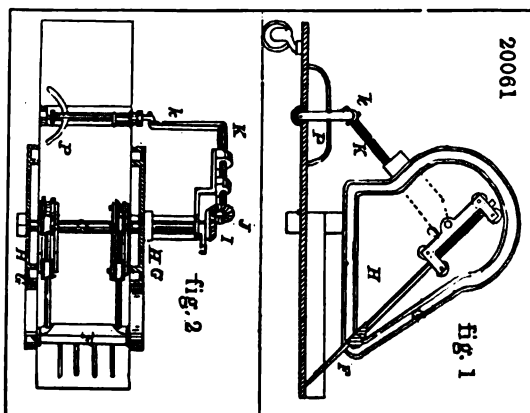
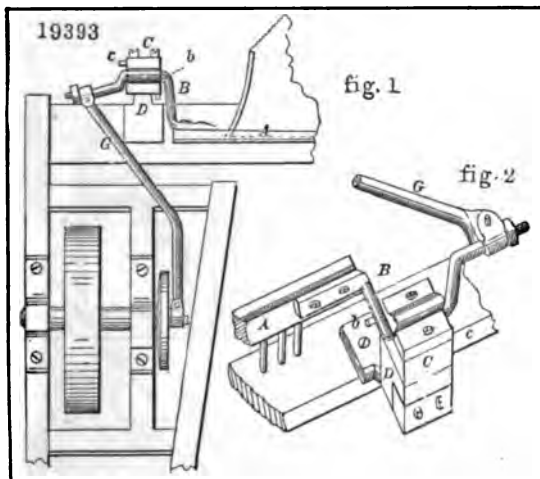
19378



21552

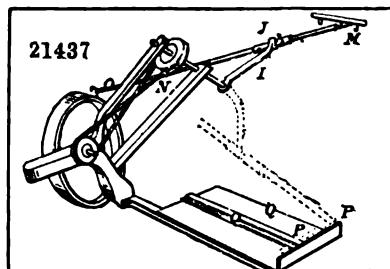
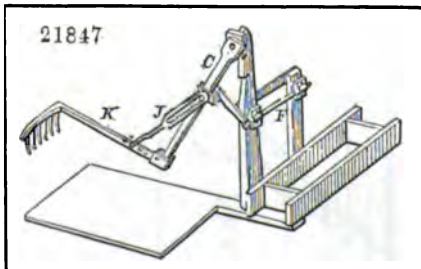
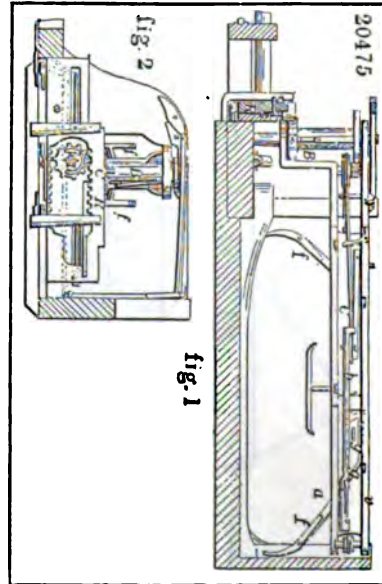
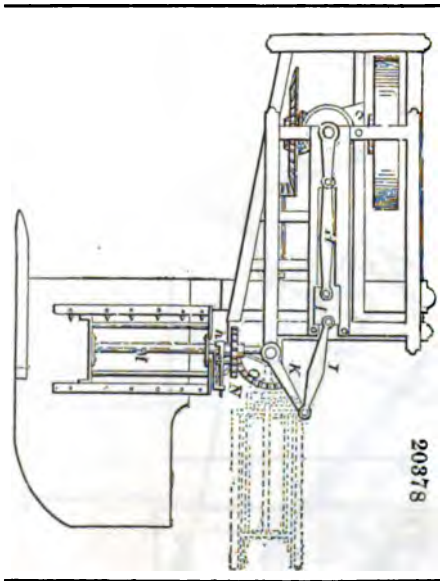
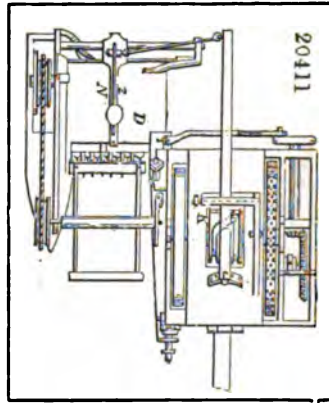
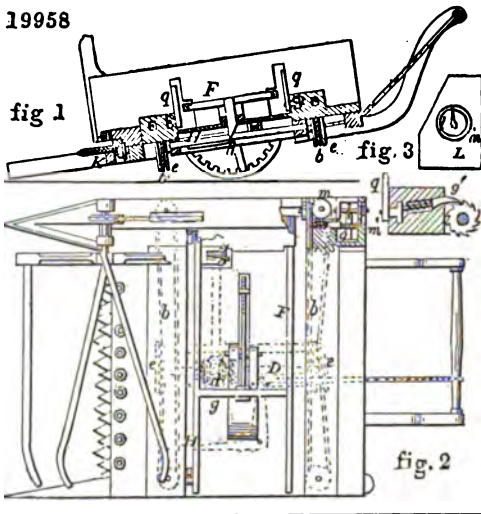


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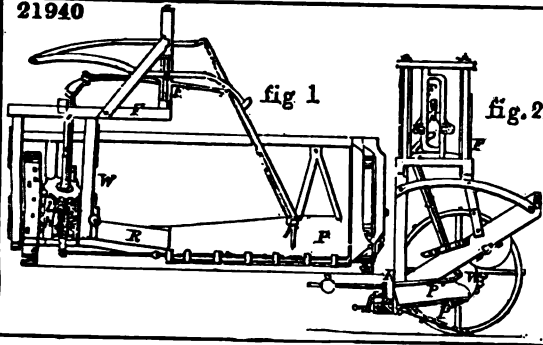




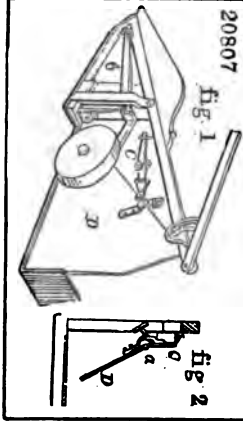
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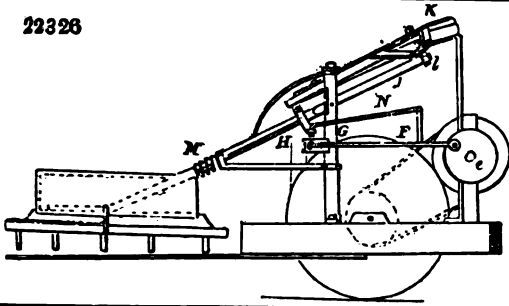
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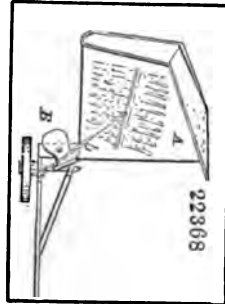
20807



22326



22868



21313

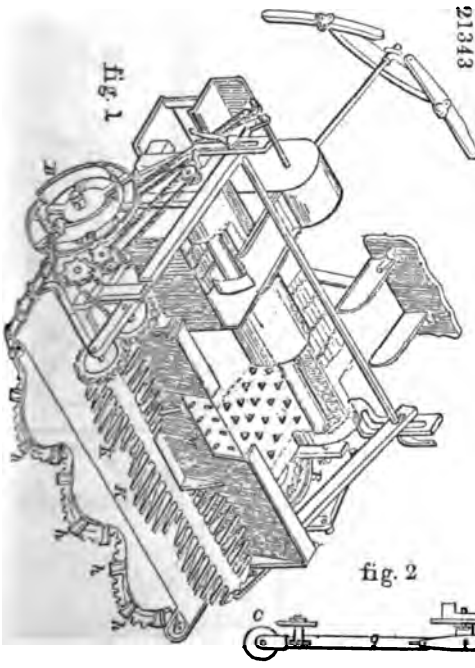
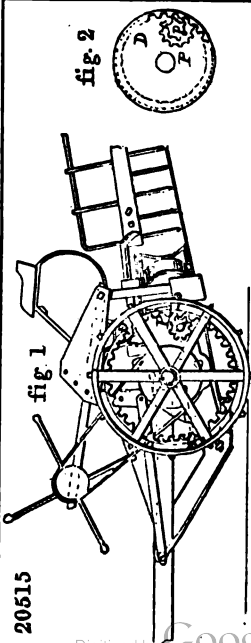
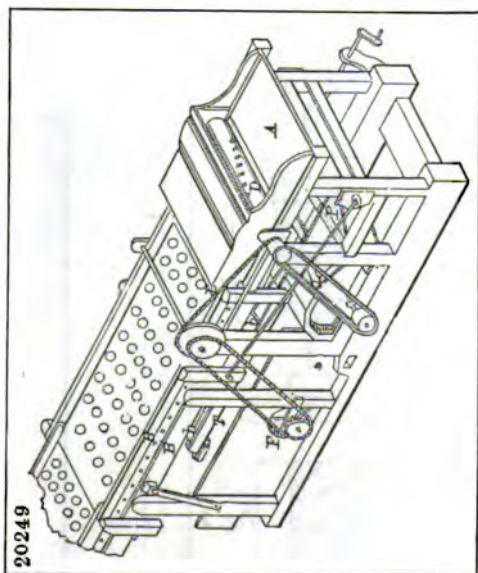
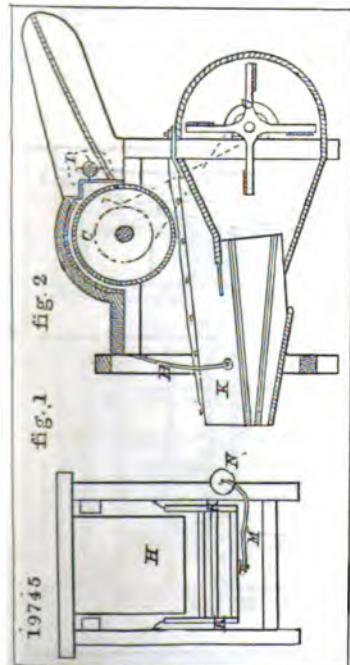
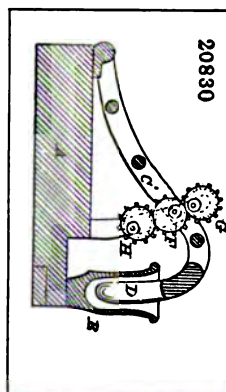
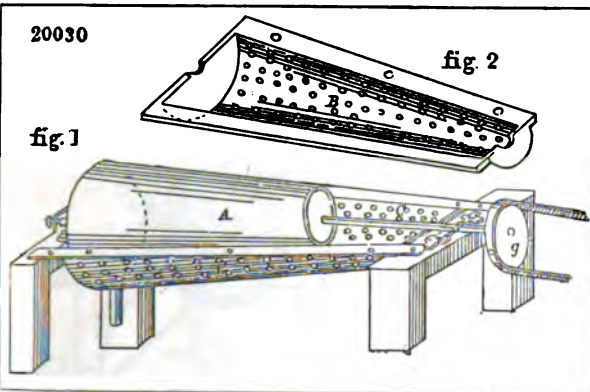
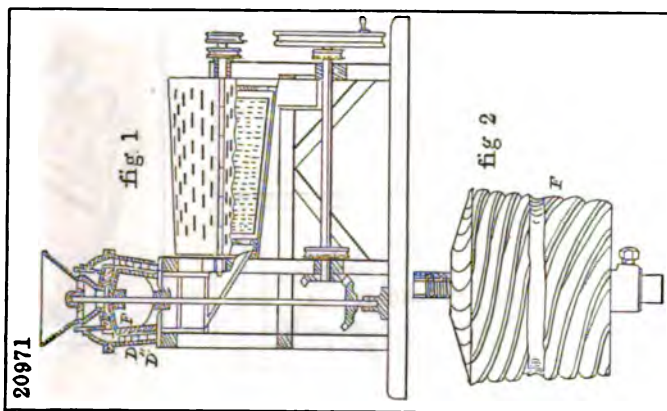


fig. 2

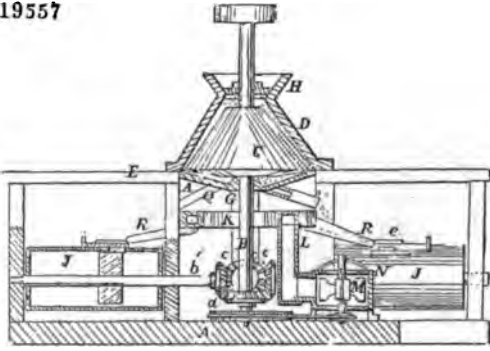


51902

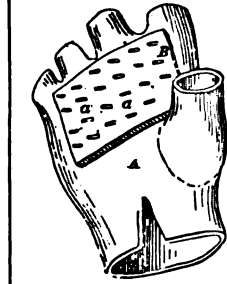




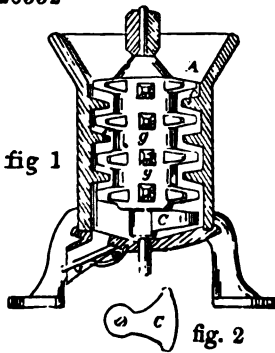
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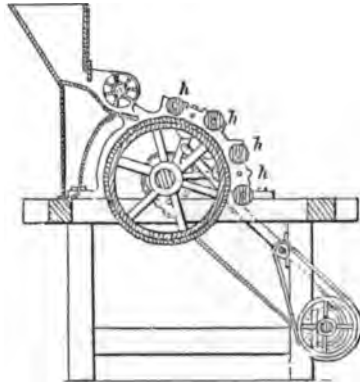
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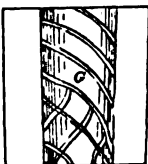
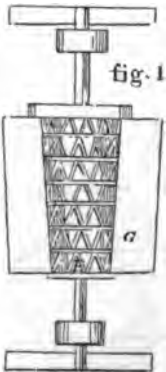
**20552**



20833



20138

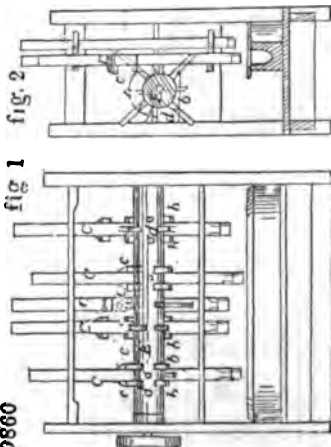


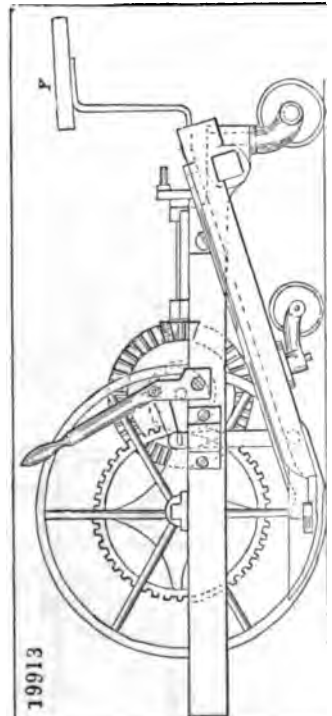
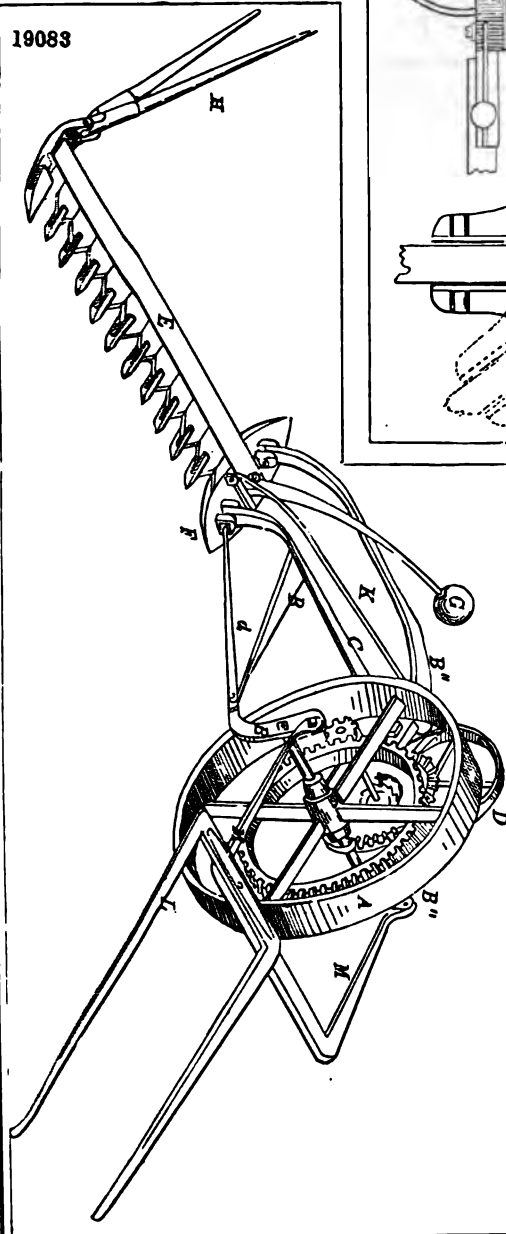
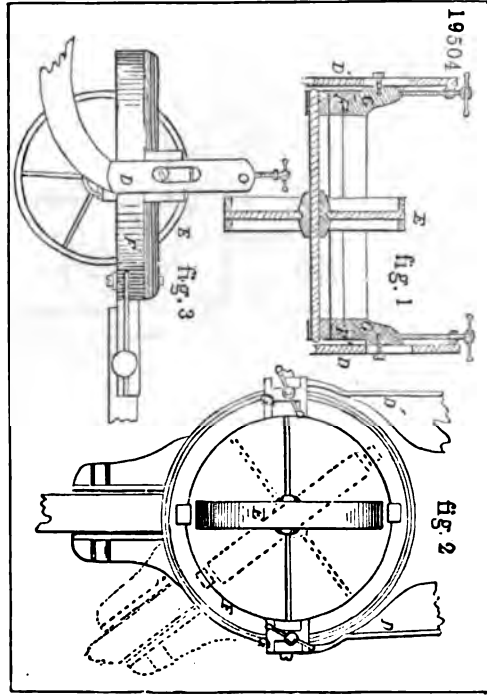
**fig. 2**

fig. 2

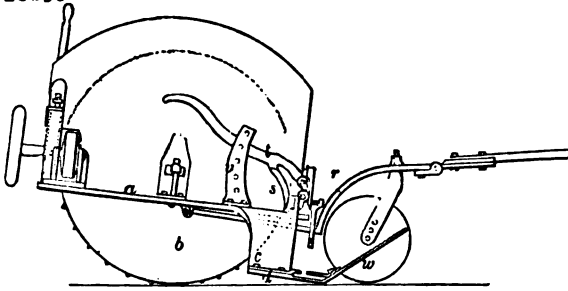
1  
fig 6c

20860

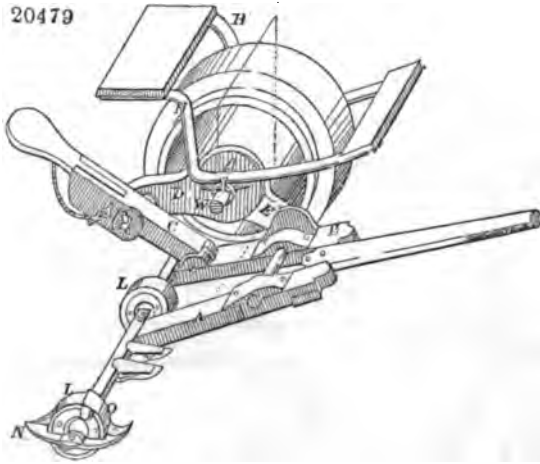




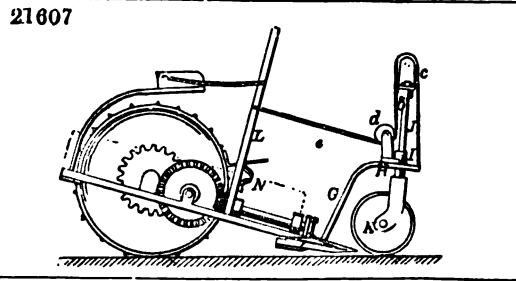
20035



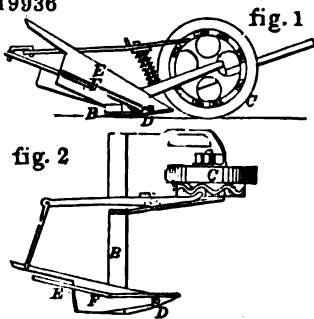
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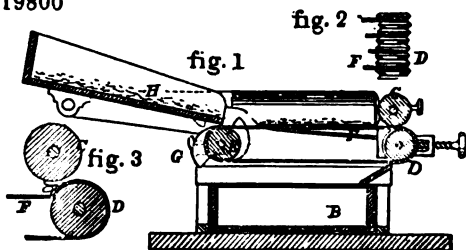
21807



19936



19800



20164

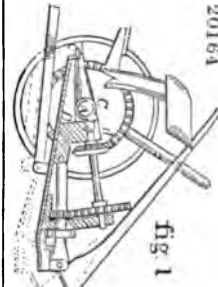


fig. 1

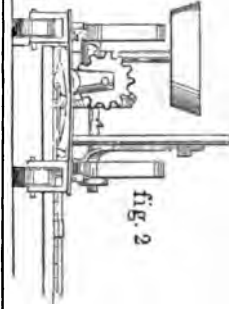


fig. 2

21777

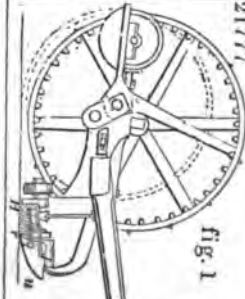
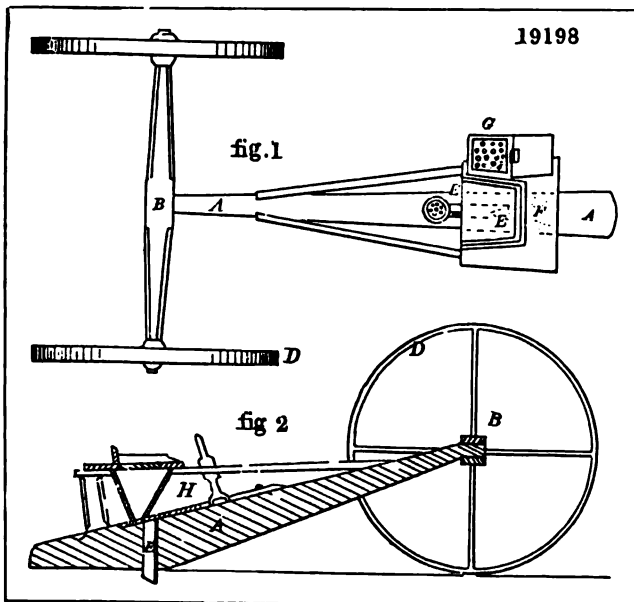
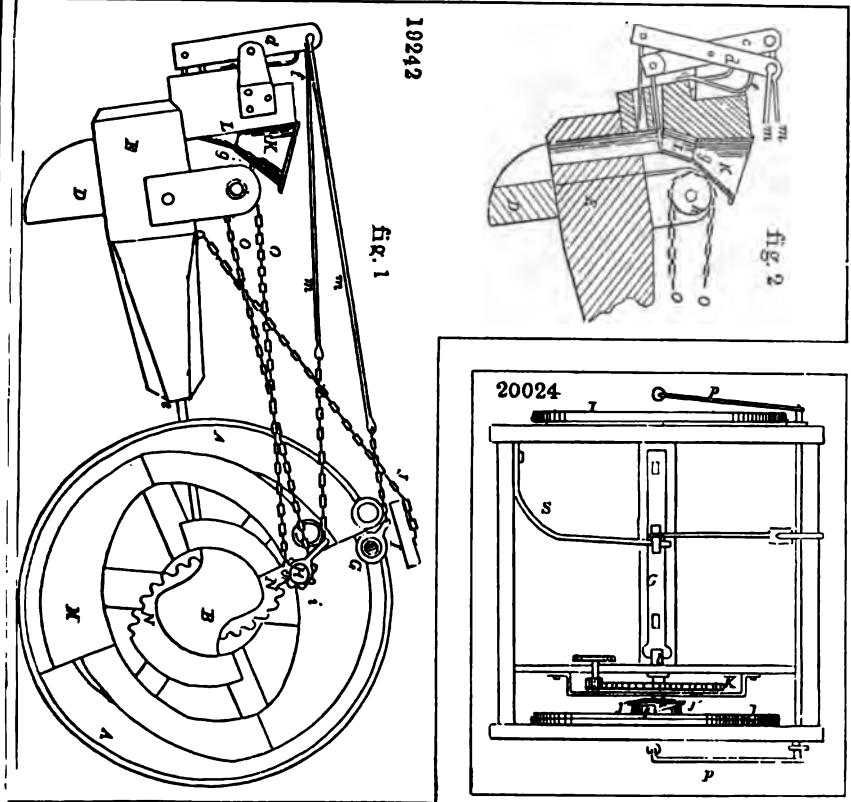


fig. 1

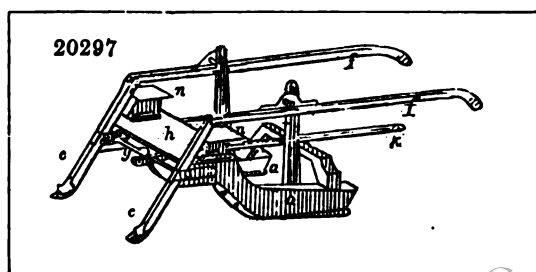
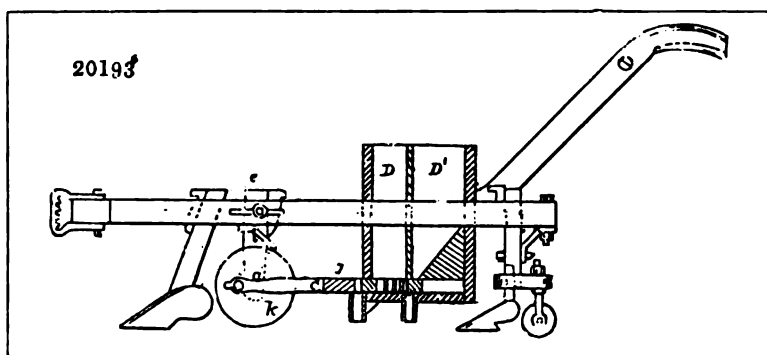
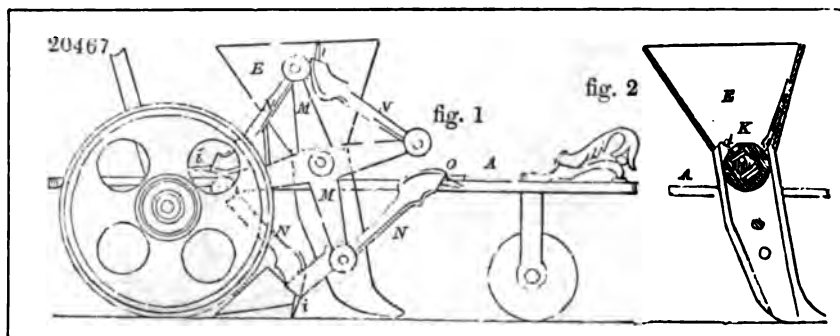
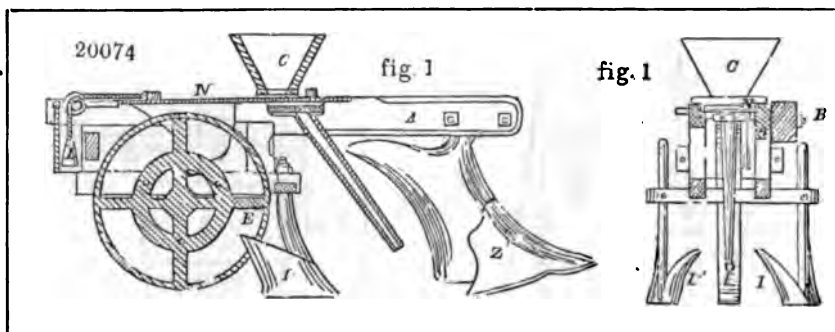


fig. 2









20639

fig. 1

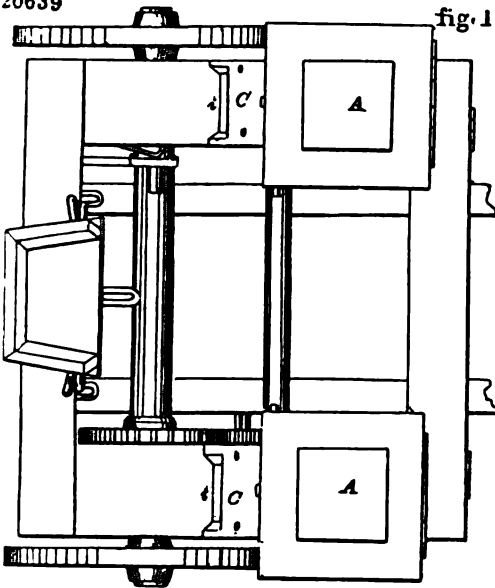
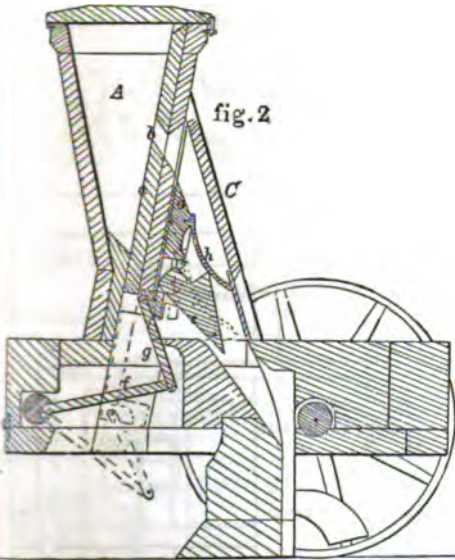
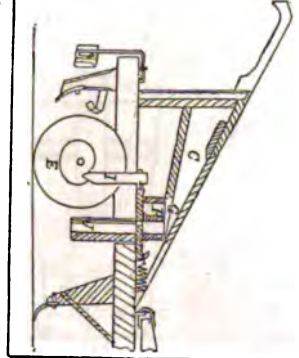


fig. 2



21280



20781

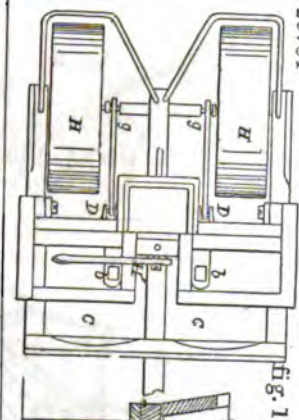
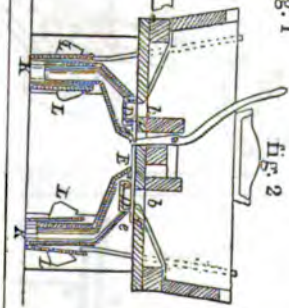


fig. 1

fig. 2



21287

fig. 1

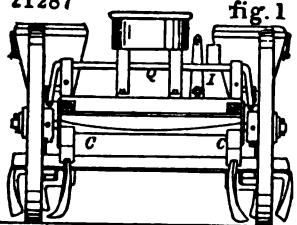
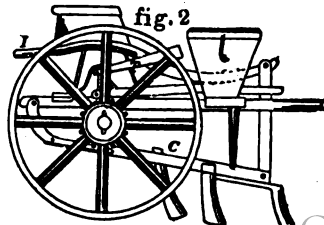


fig. 2



21187

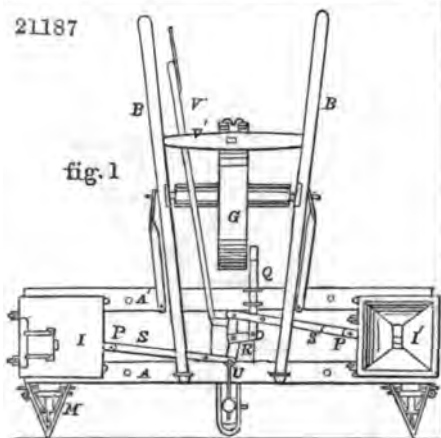
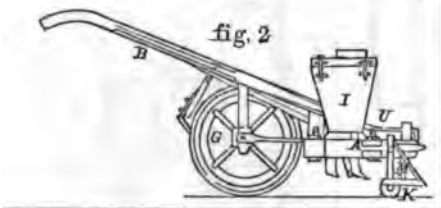
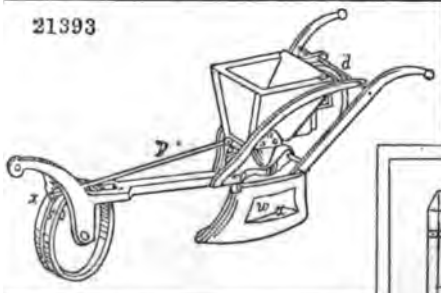


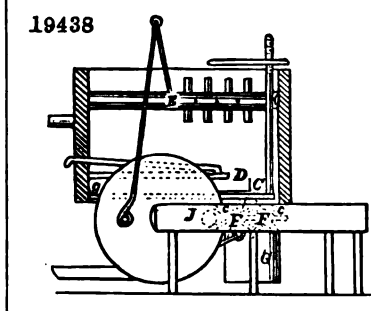
fig. 2



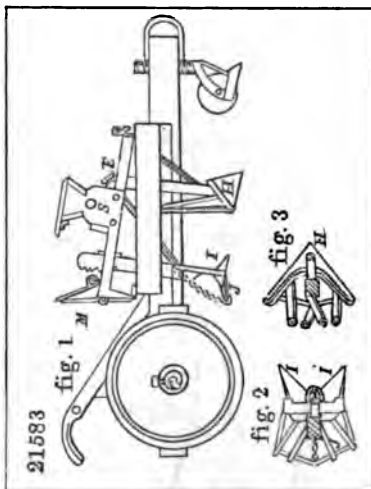
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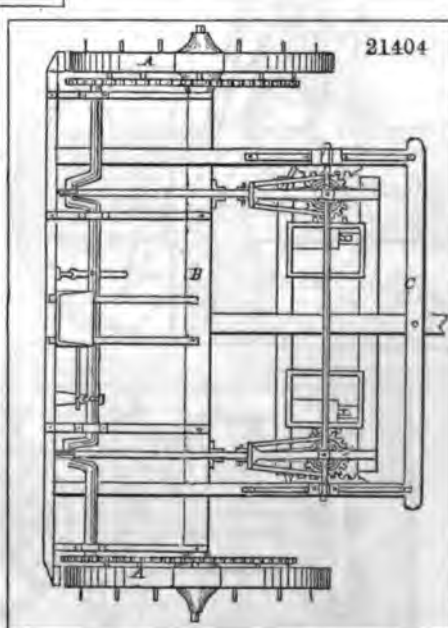
19438



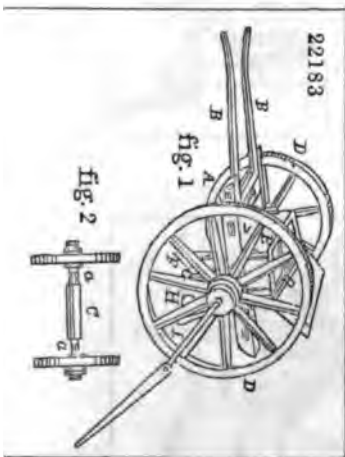
21583



21404



22183



21308

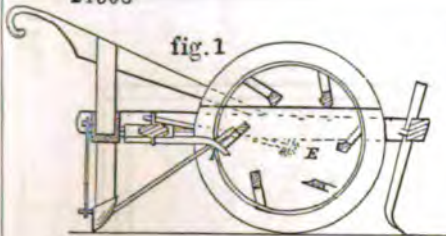


fig. 1

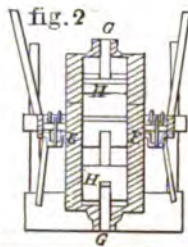


fig. 2

19329

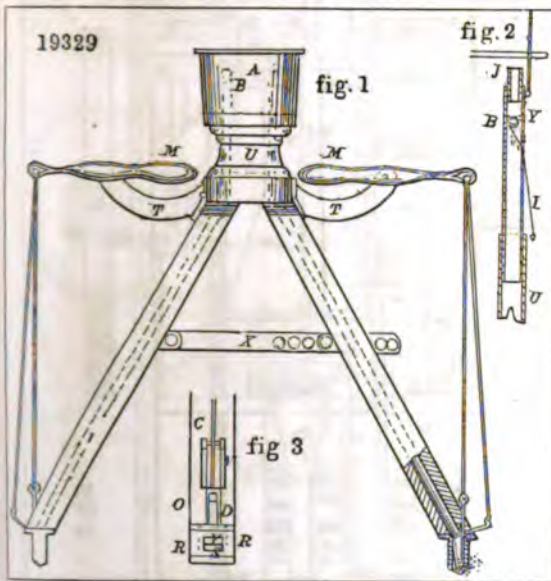


fig. 1



fig. 2

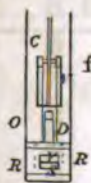


fig. 3

19874

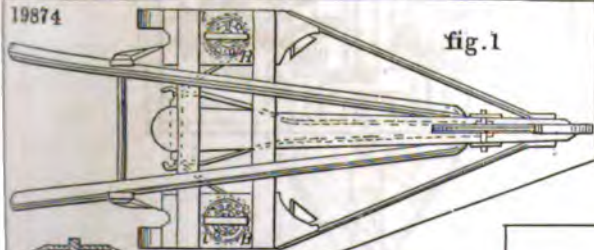


fig. 1

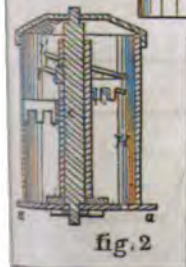
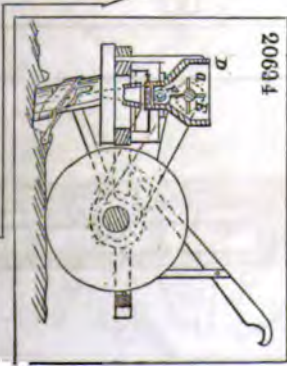
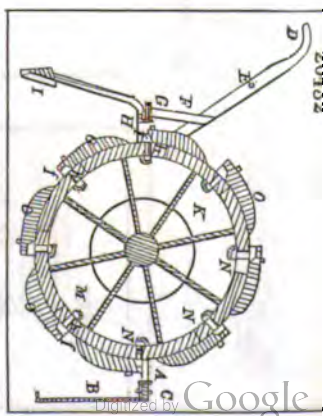


fig. 2



20634



20702

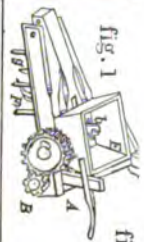


fig. 1

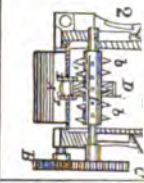


fig. 2

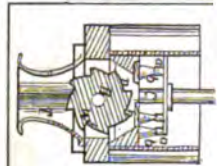


fig. 1

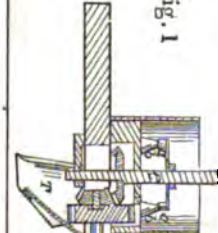


fig. 2

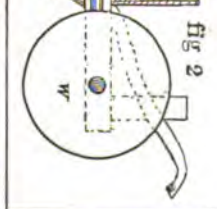


fig. 1



fig. 2

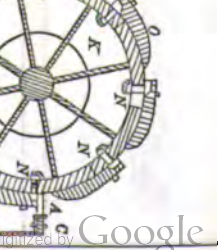


fig. 1

19054

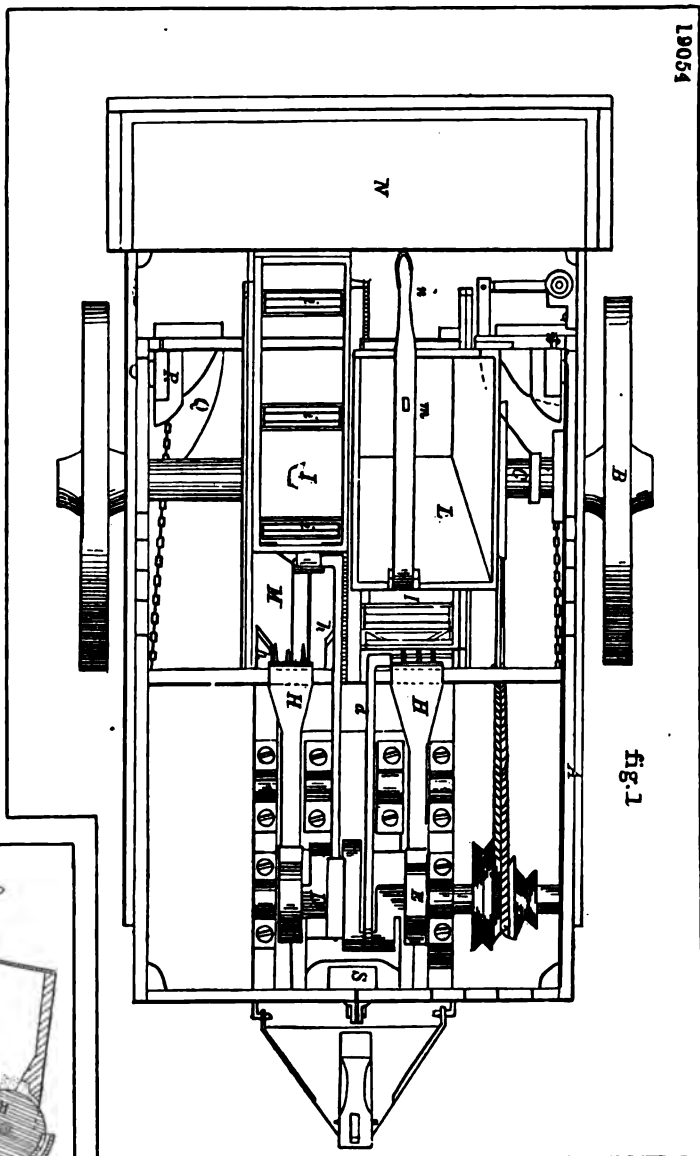
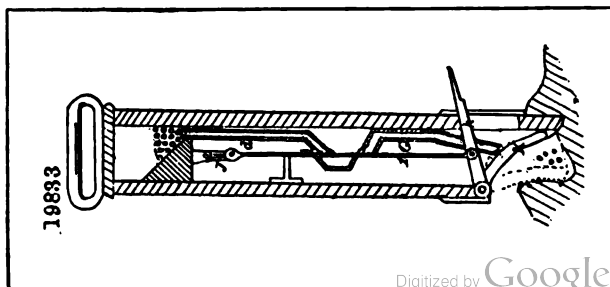
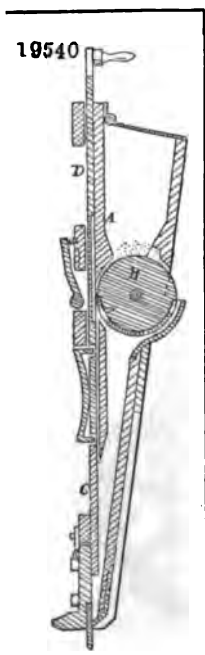


fig. 1



19054



19540

19294

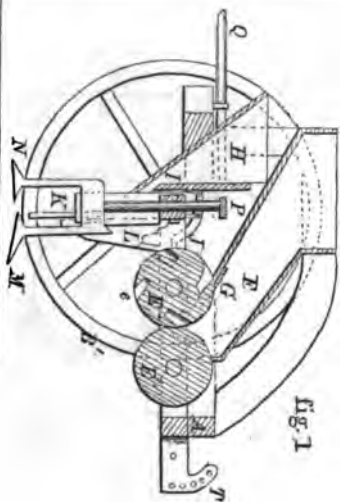


fig. 1

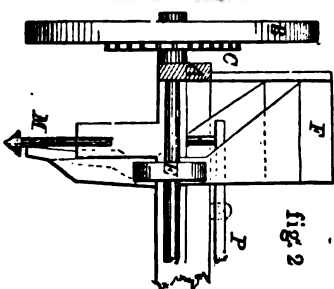


fig. 2

19178

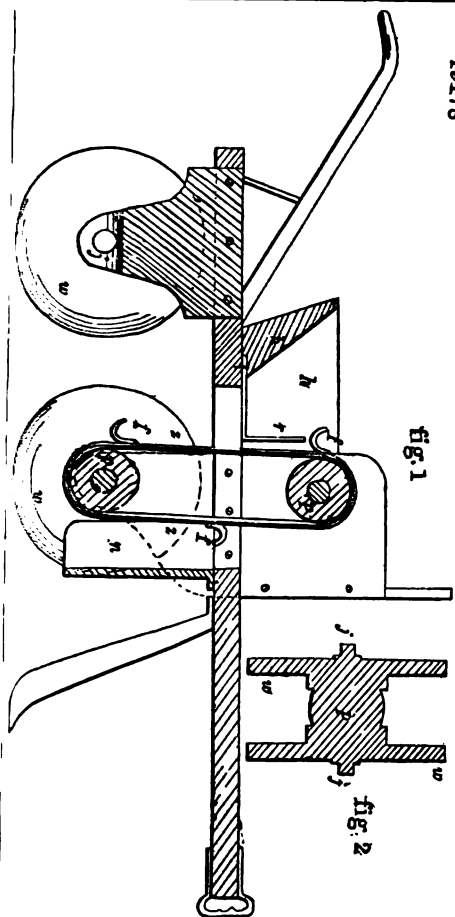
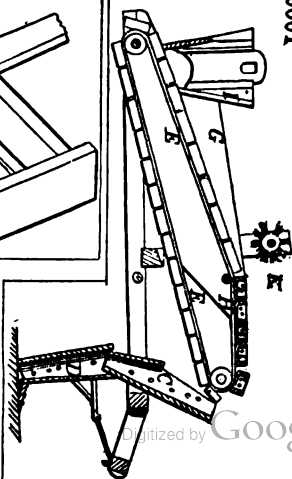


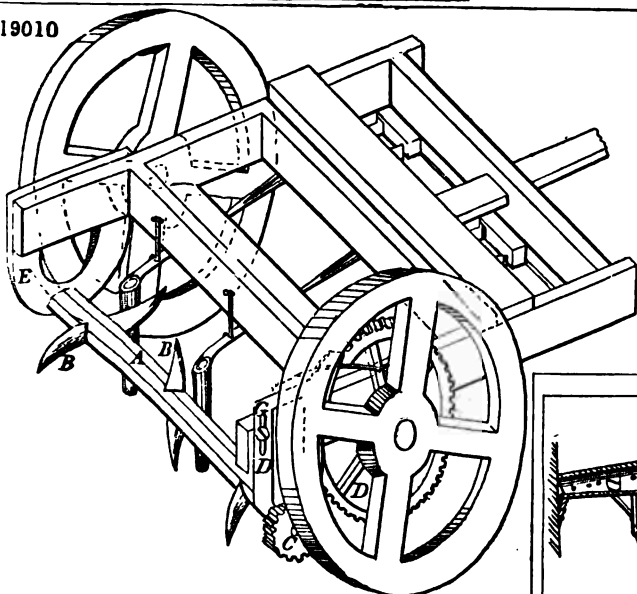
fig. 1

fig. 2

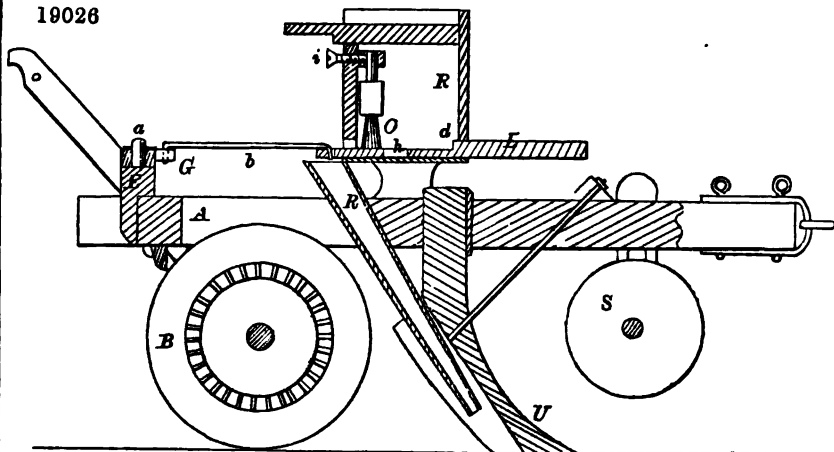
20001



19010

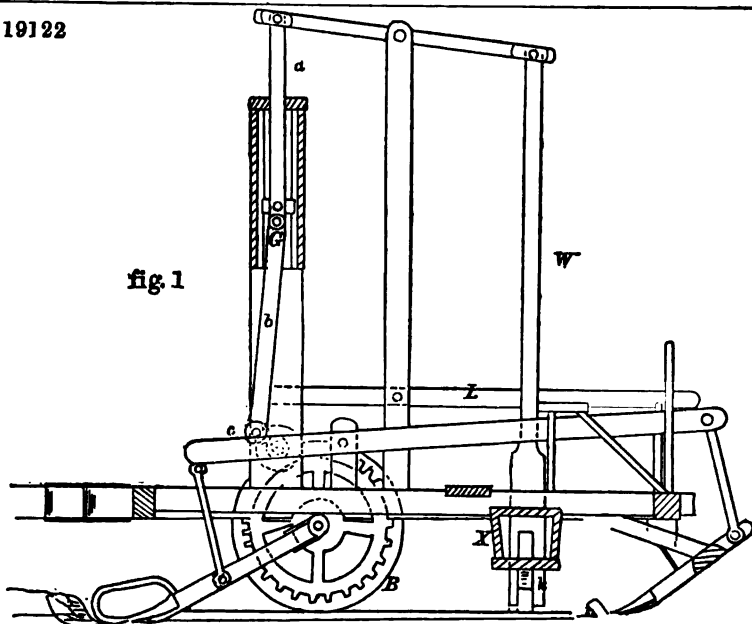


19026

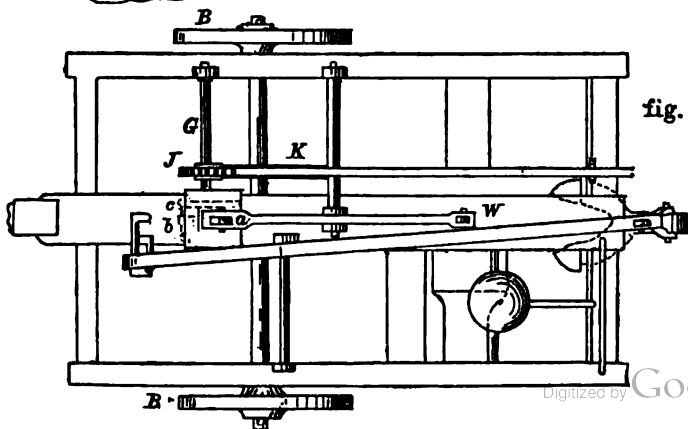


19122

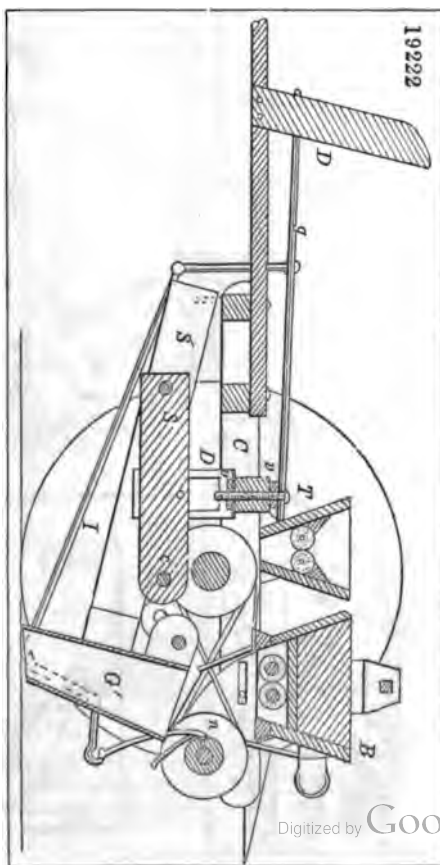
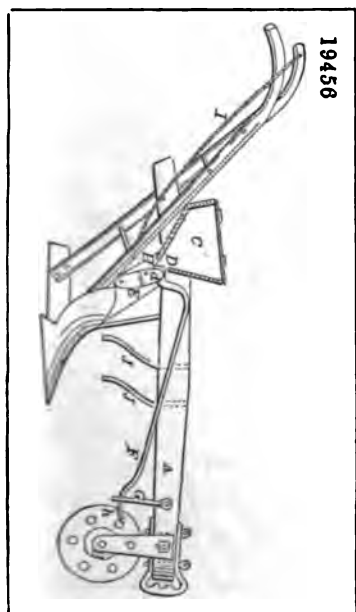
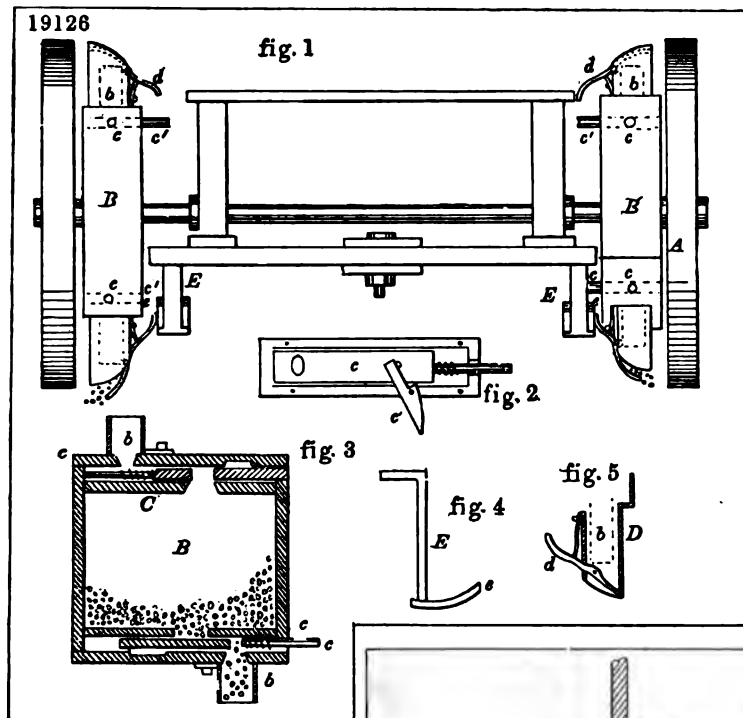
**fig. 1**



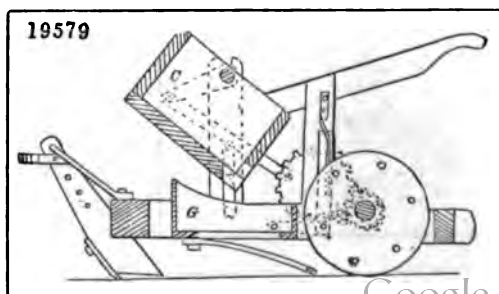
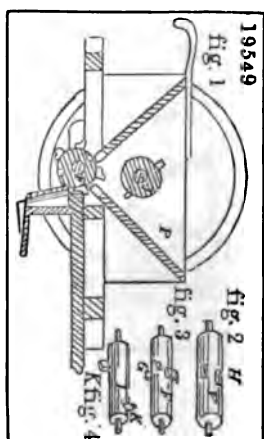
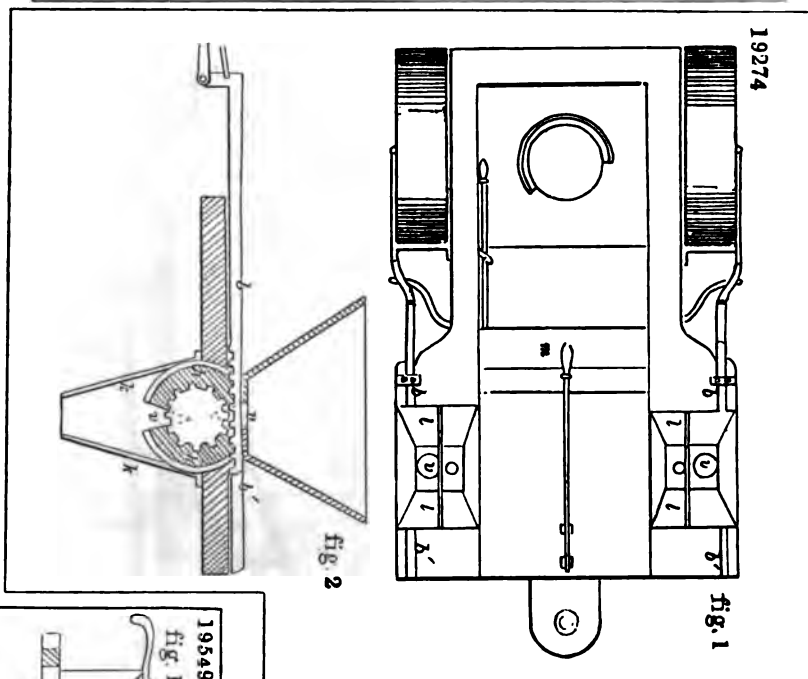
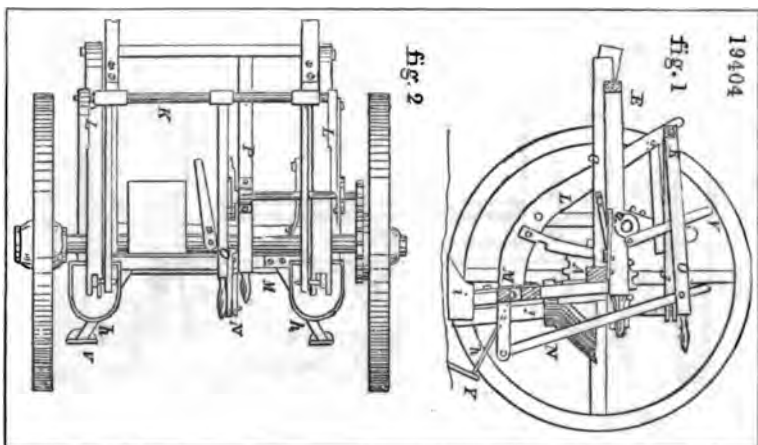
**fig. 2**

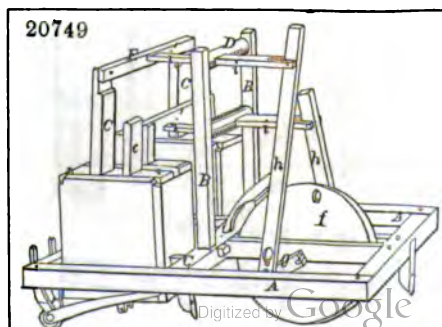
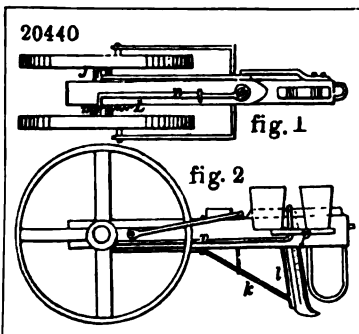
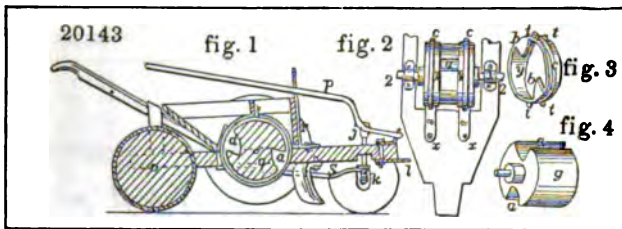
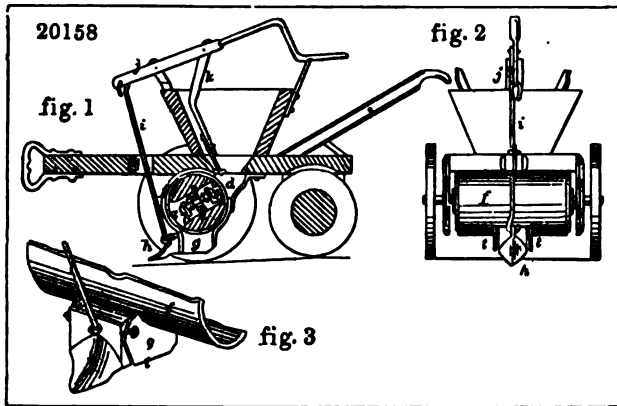
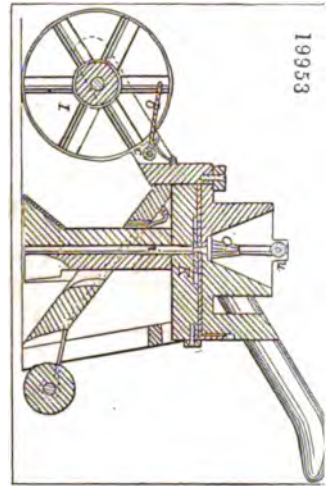
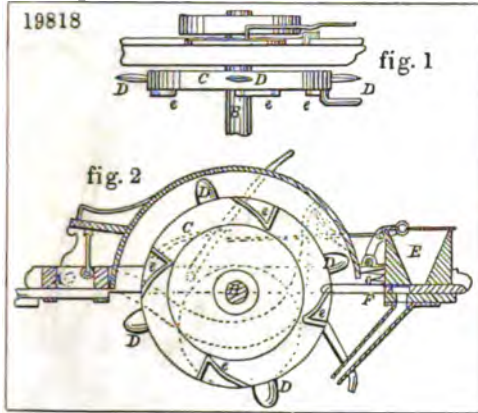




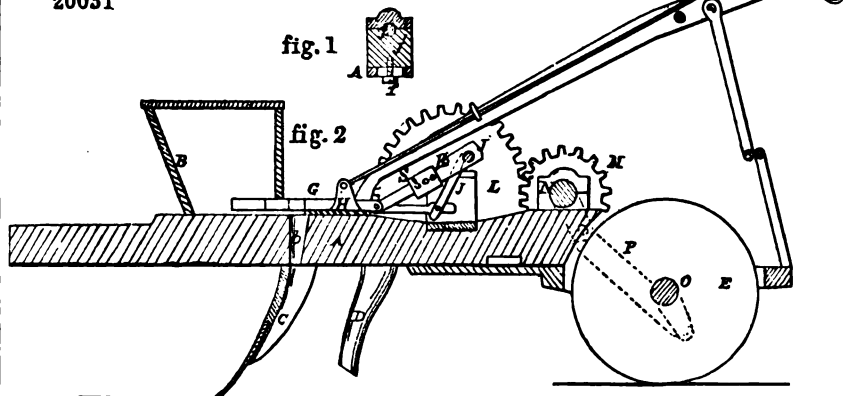




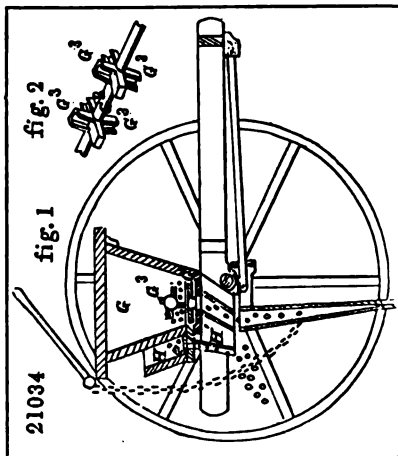
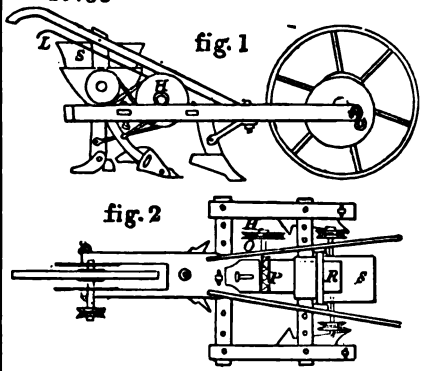




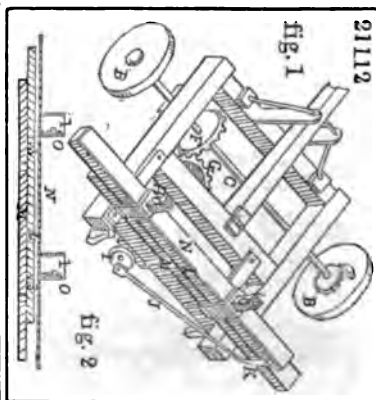
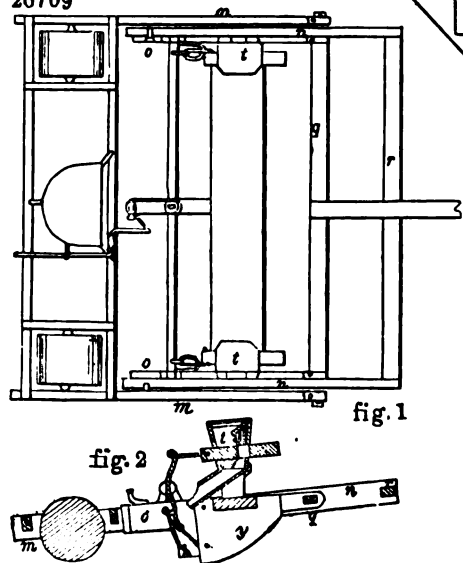
20051



20738



20709

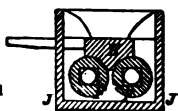


21102

fig. 1



fig. 2

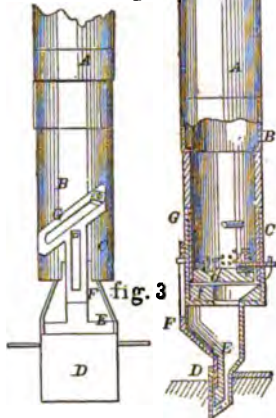


21127

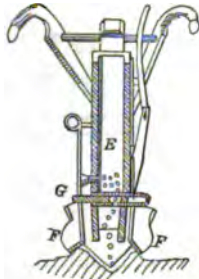
fig. 1



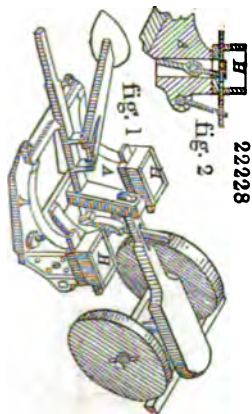
fig. 2



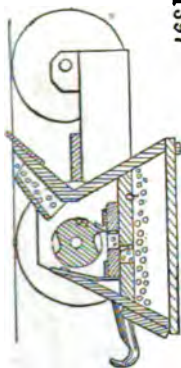
21217



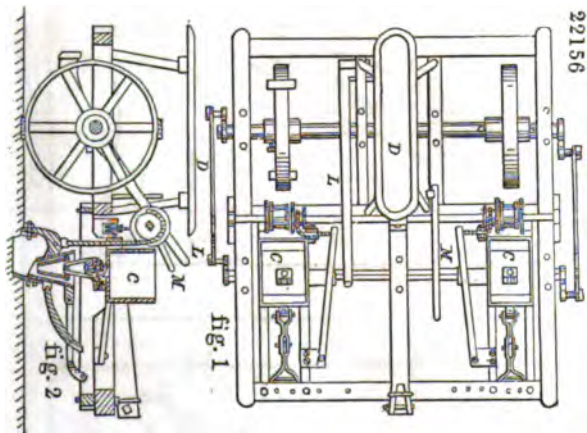
22228



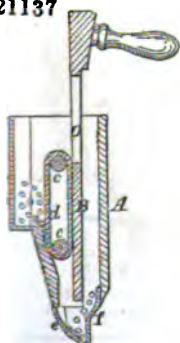
21397



22156



21137



21440

fig. 1

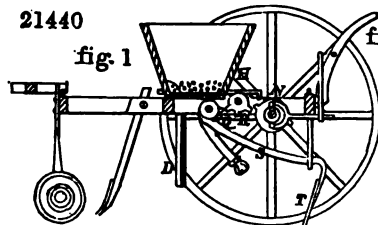
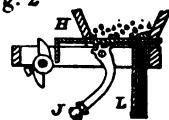
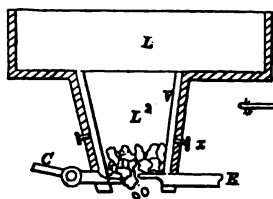
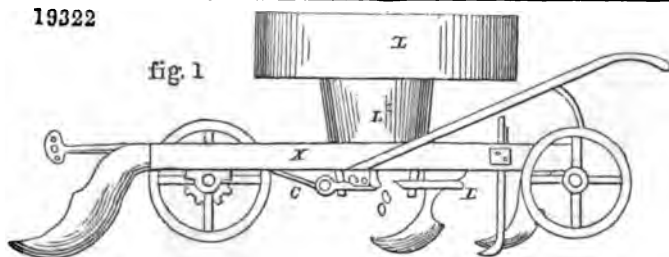


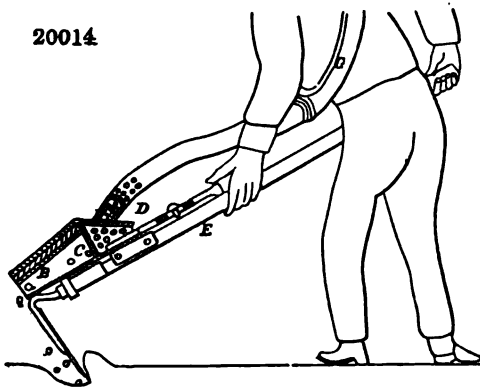
fig. 2



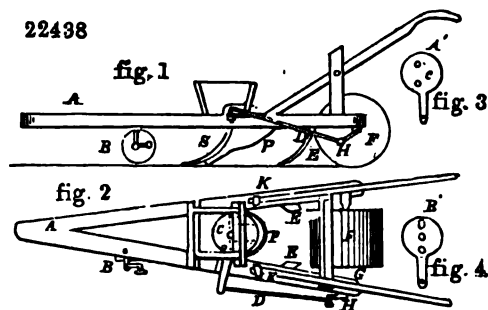
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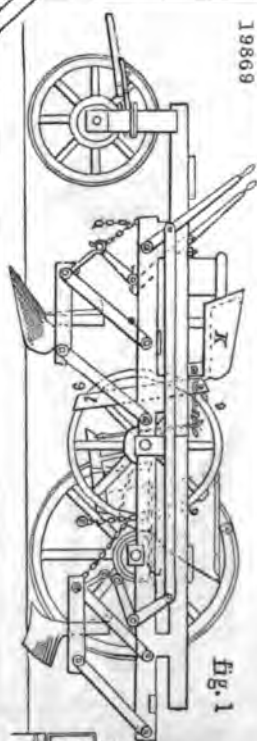
20014



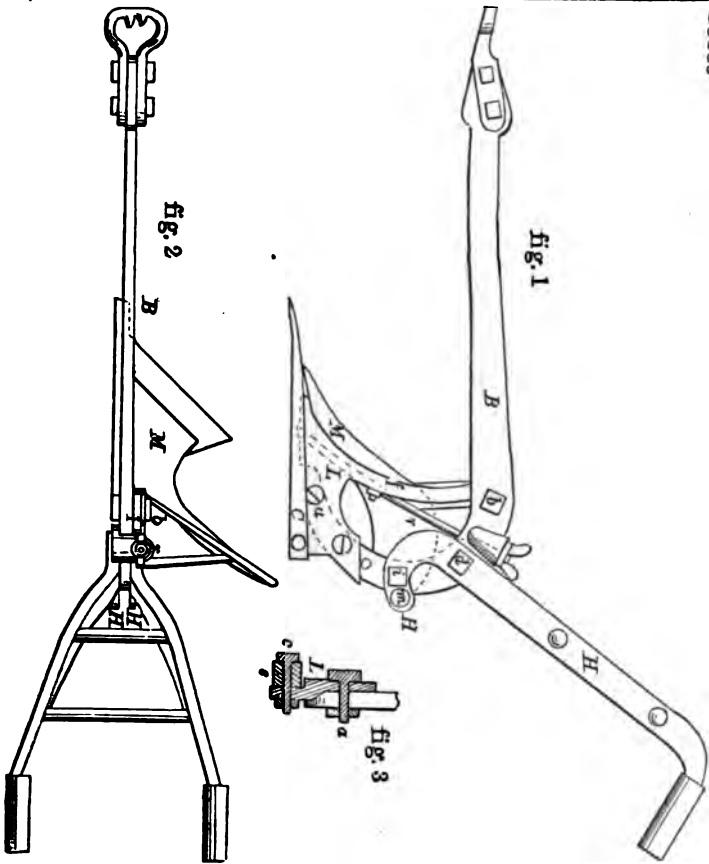
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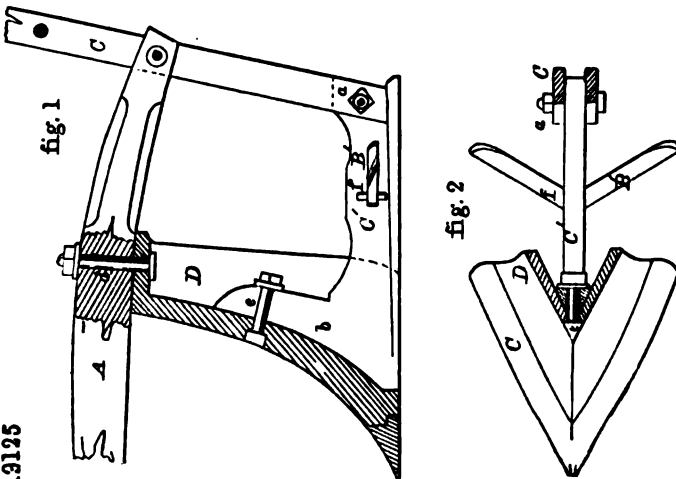
19869

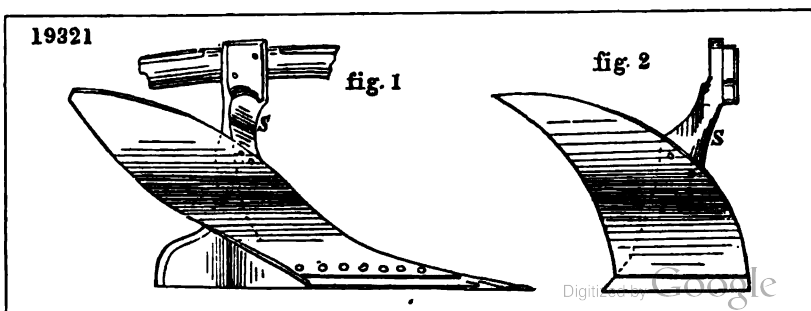
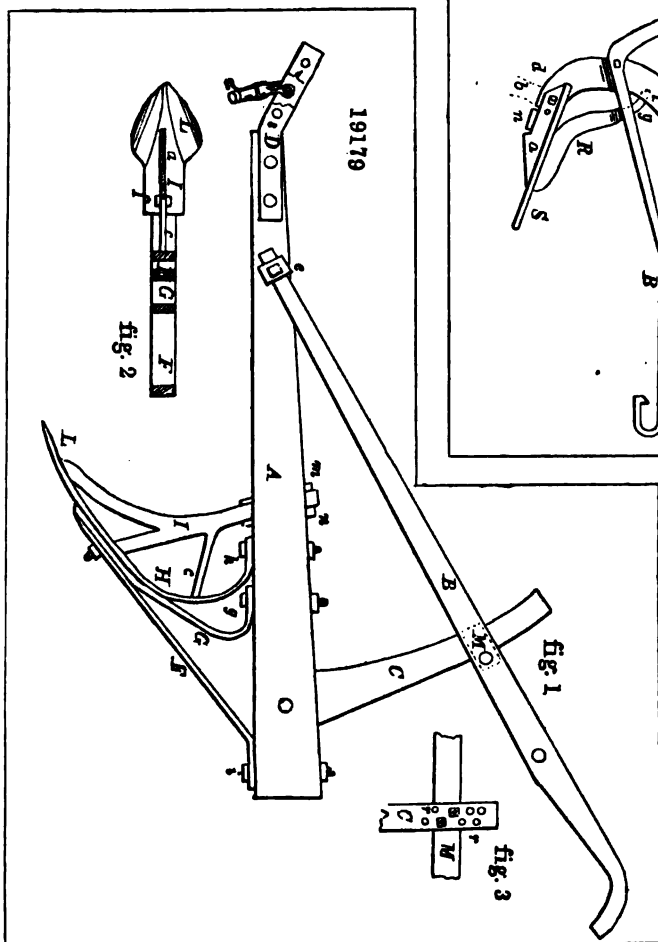
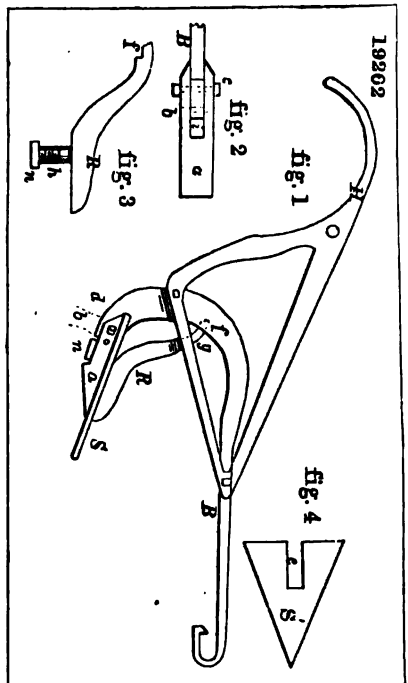


19163

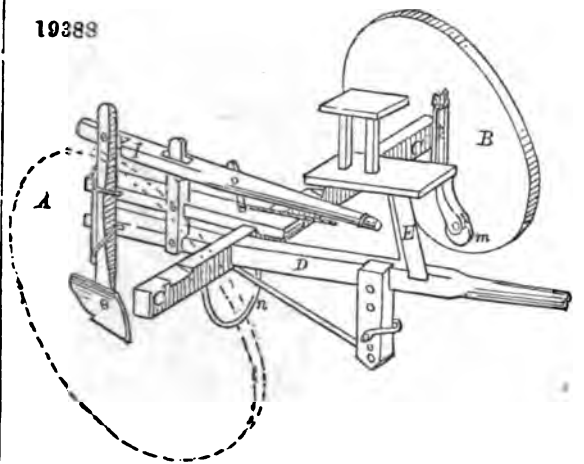


19125

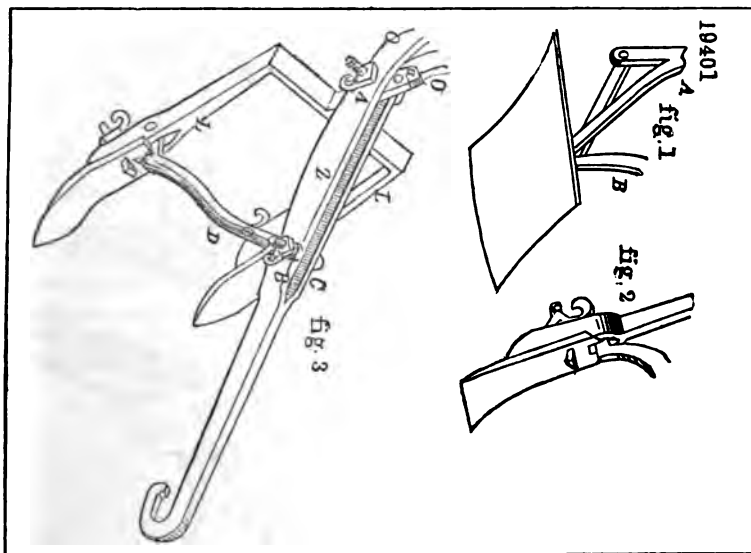
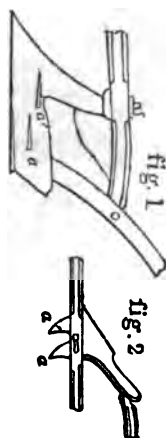




19388

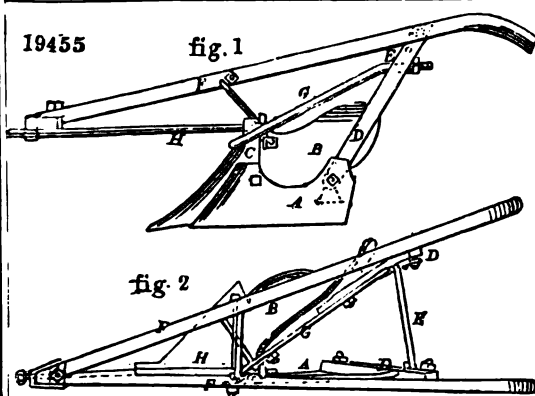


19391



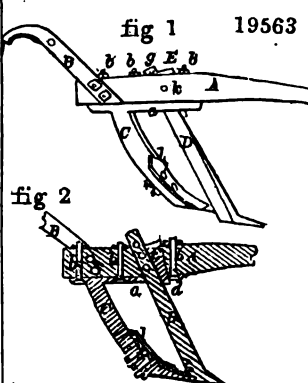
19455

fig. 1



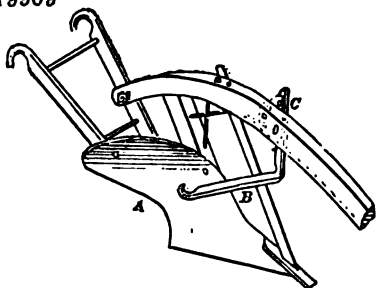
19563

fig 1

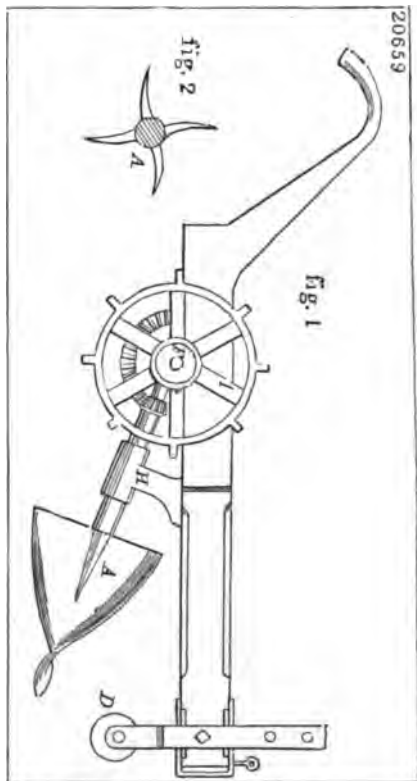
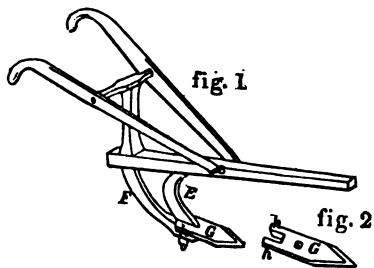




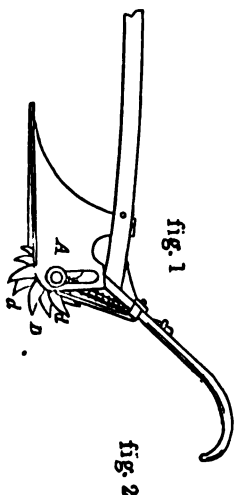
19909



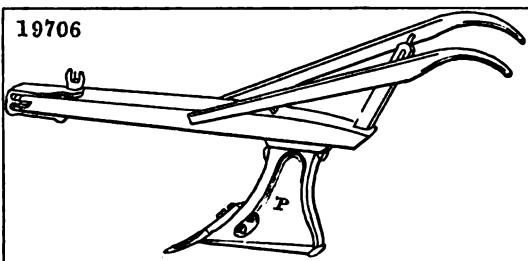
19886



19878



19706



20269

fig 1

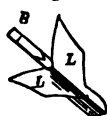
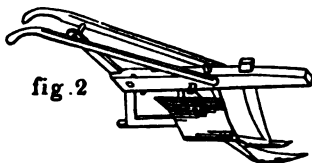
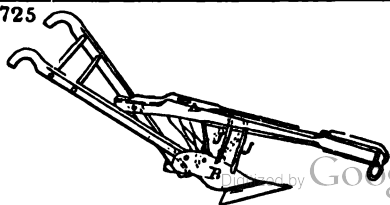
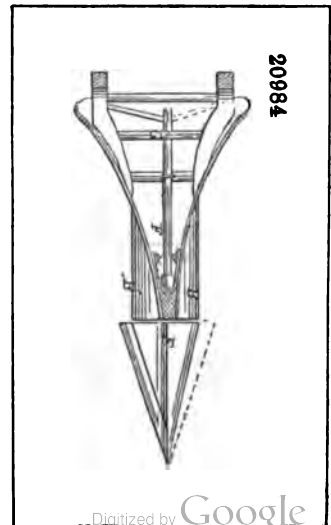
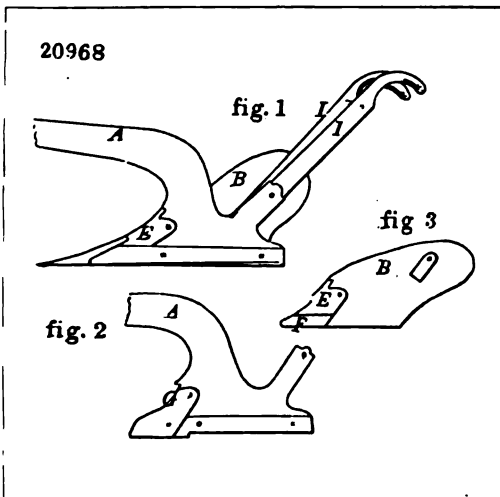
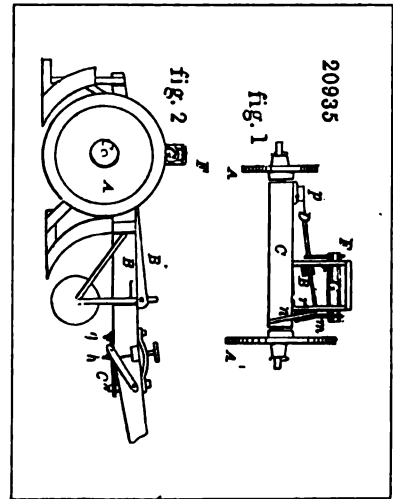
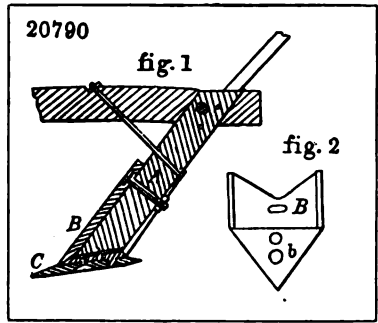
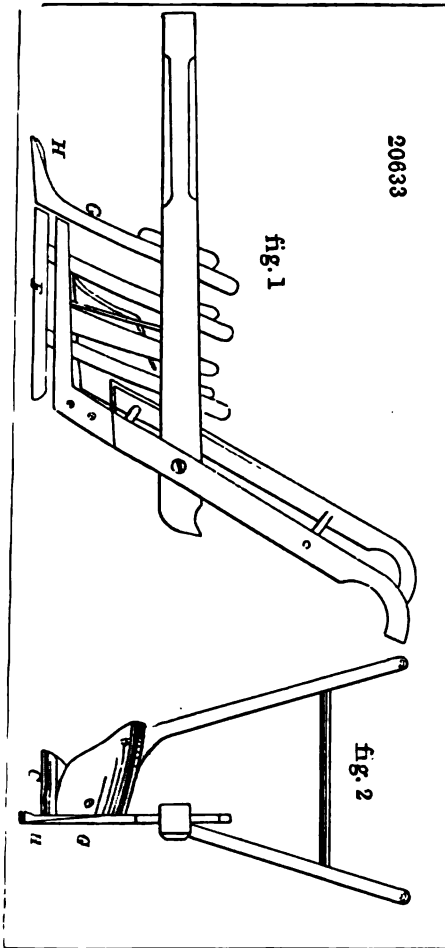


fig. 2

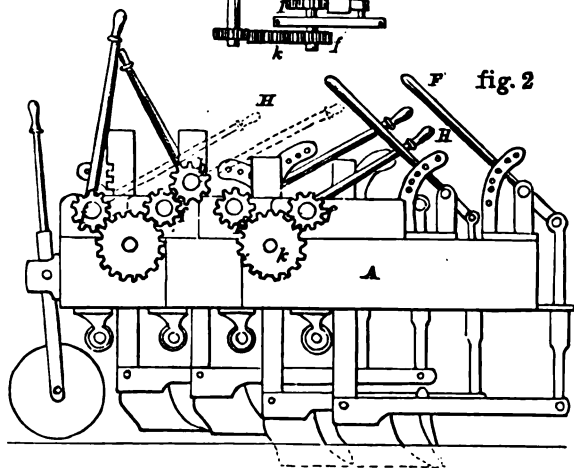
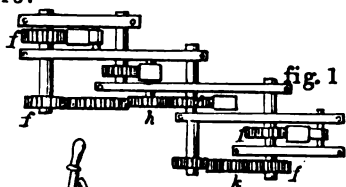


19725





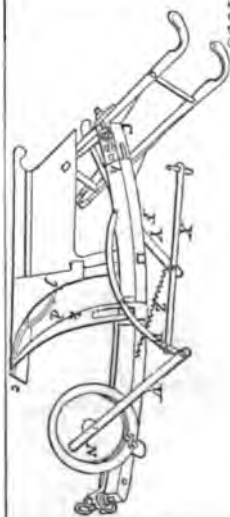
**21167**



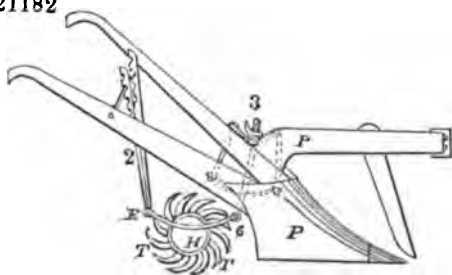
21423



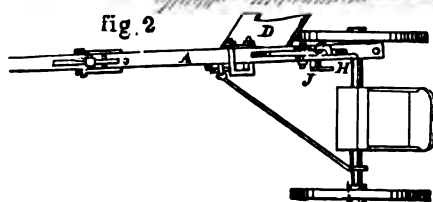
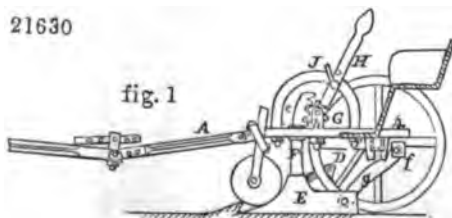
21598



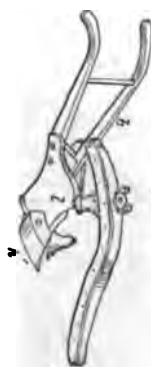
21182



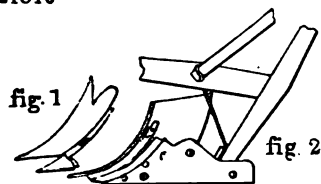
21630



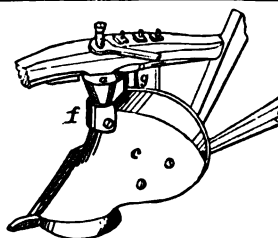
21824



21846



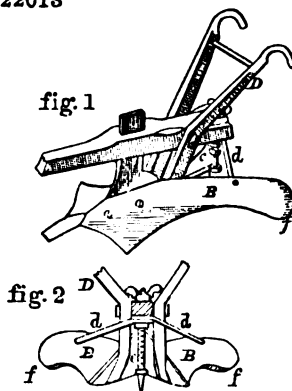
21953



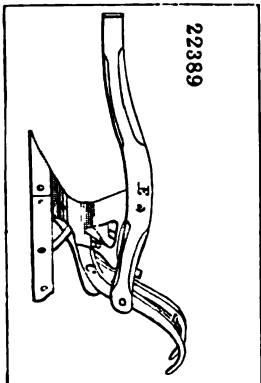
21975



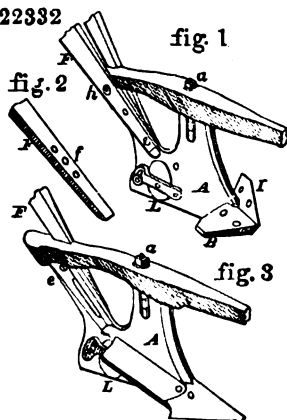
22013



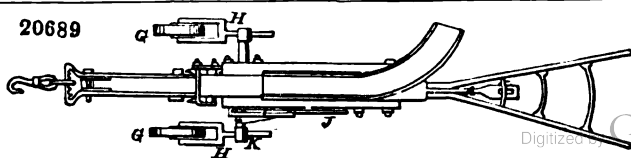
22389



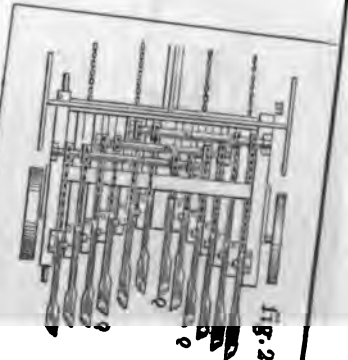
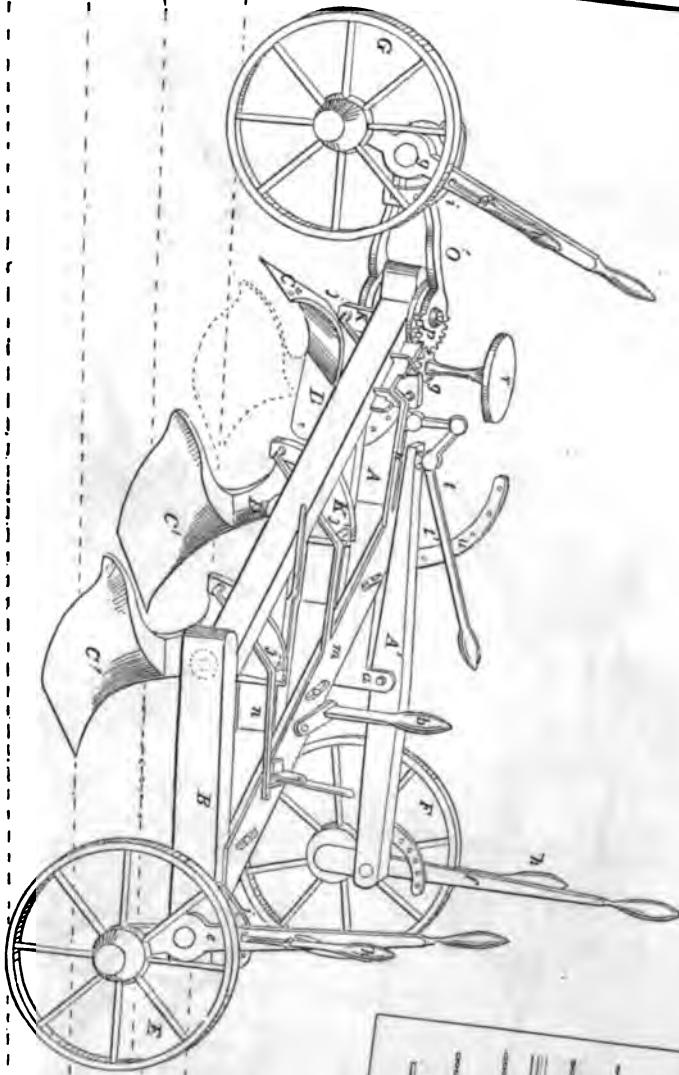
22332



20689

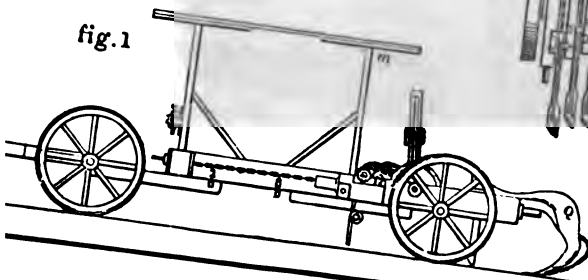


19077



0122

fig.1



20647

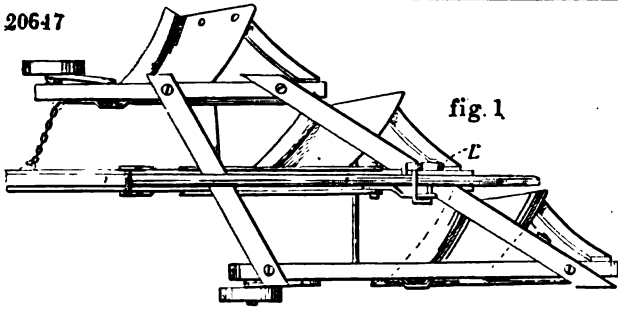
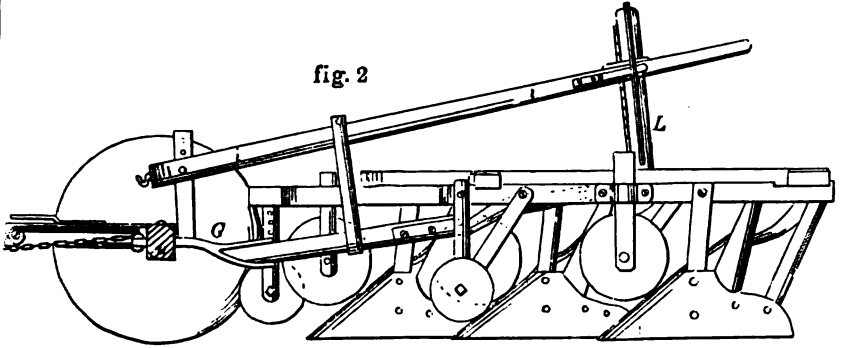
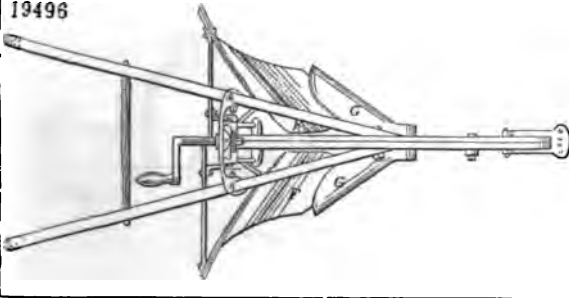


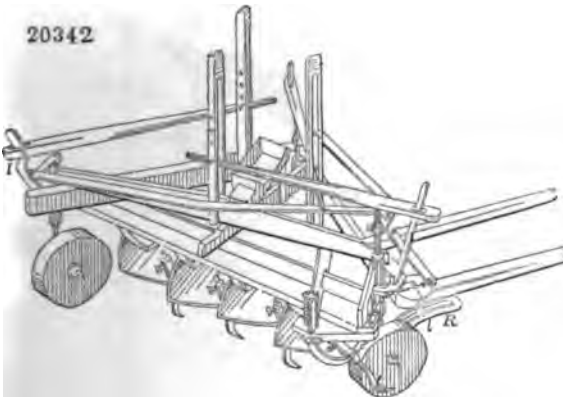
fig. 2



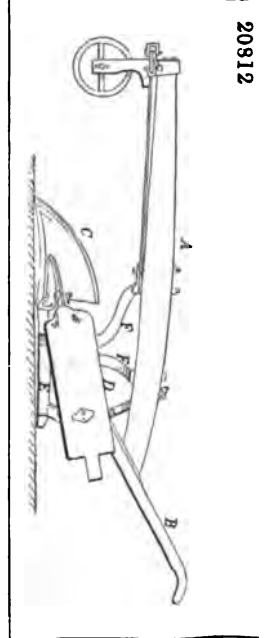
19496



20342



20812



19412

fig. 1

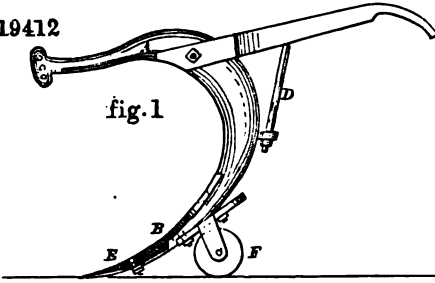
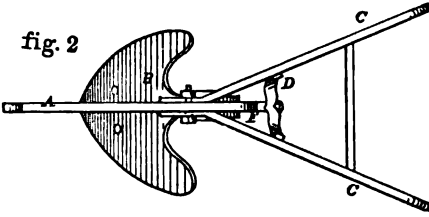
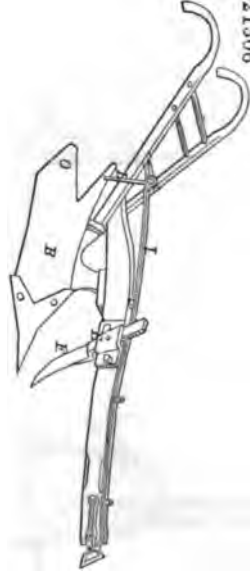


fig. 2



21308



21547

fig. 1

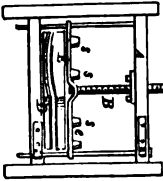
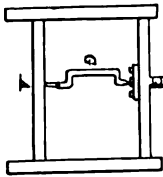
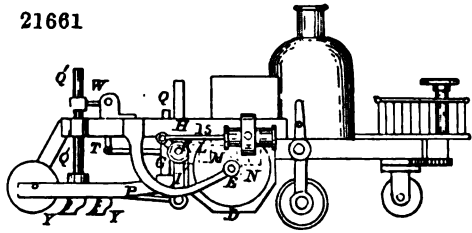


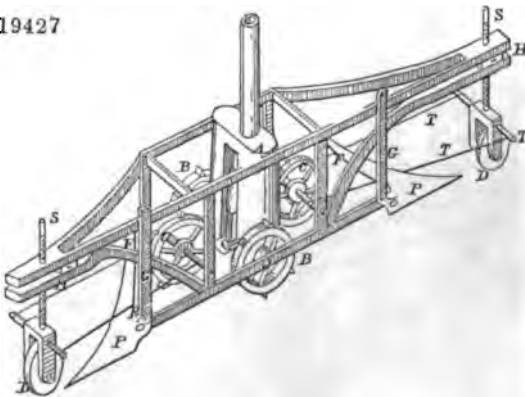
fig. 2



21661



19427



19215

fig. 1

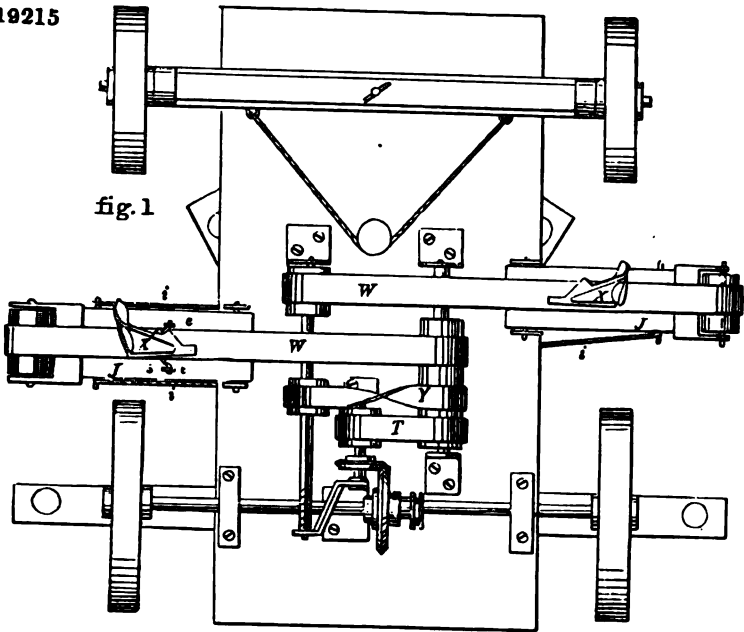
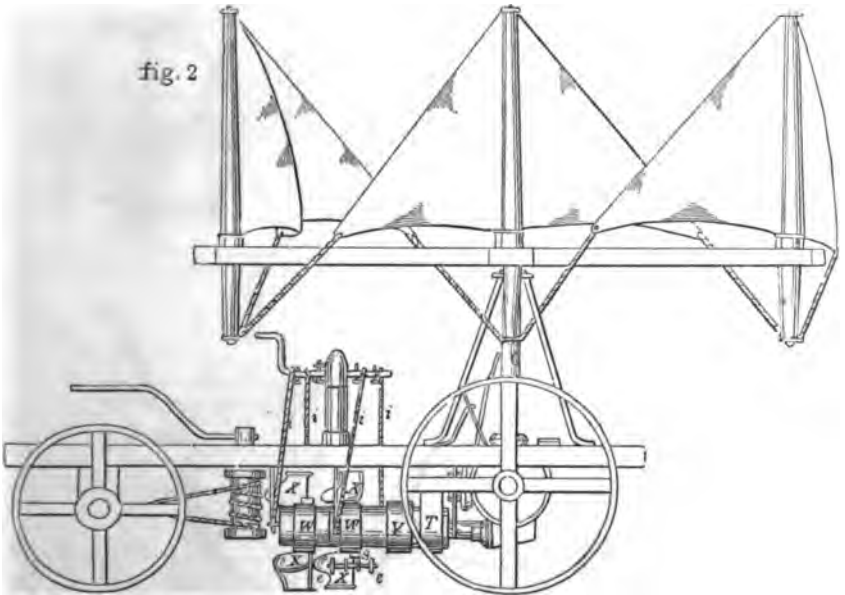


fig. 2





19189

fig. 1

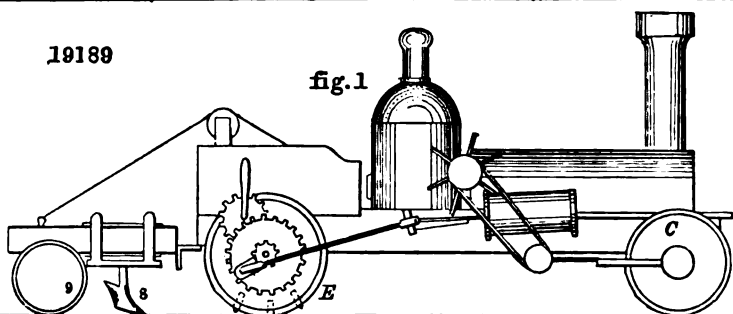


fig. 2

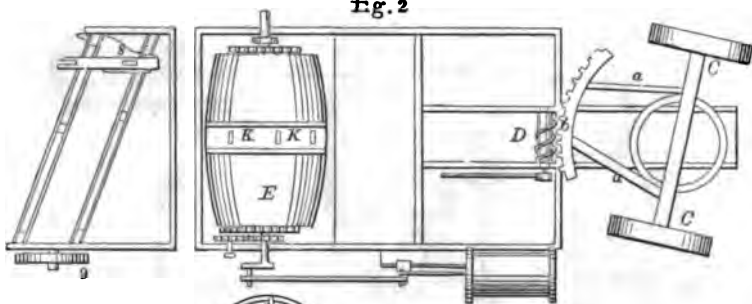
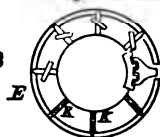
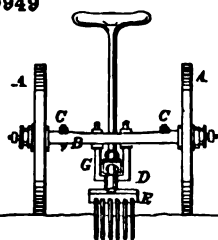


fig. 3



20949



19849

fig. 1

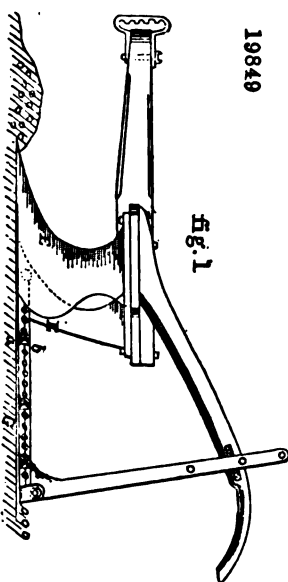
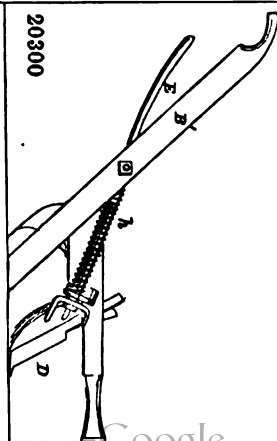


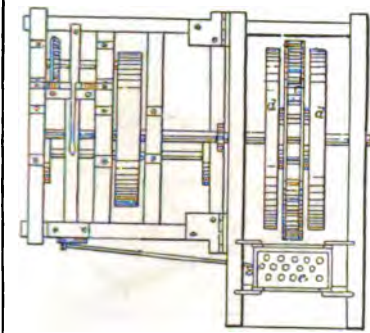
fig. 2



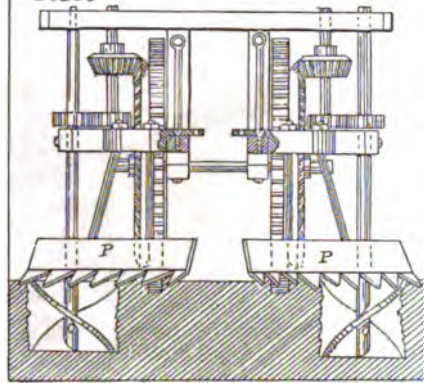
20300



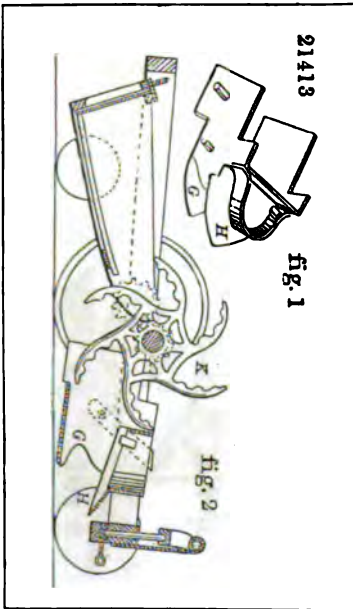
21226



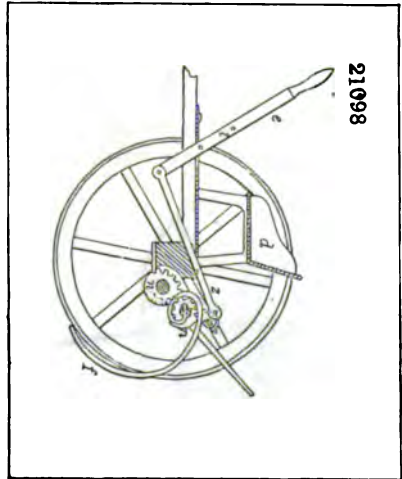
21225



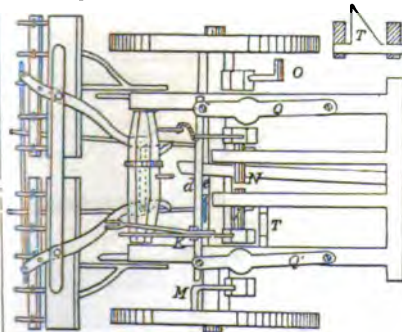
21413



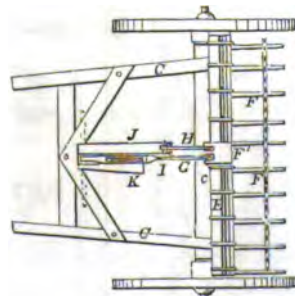
21098



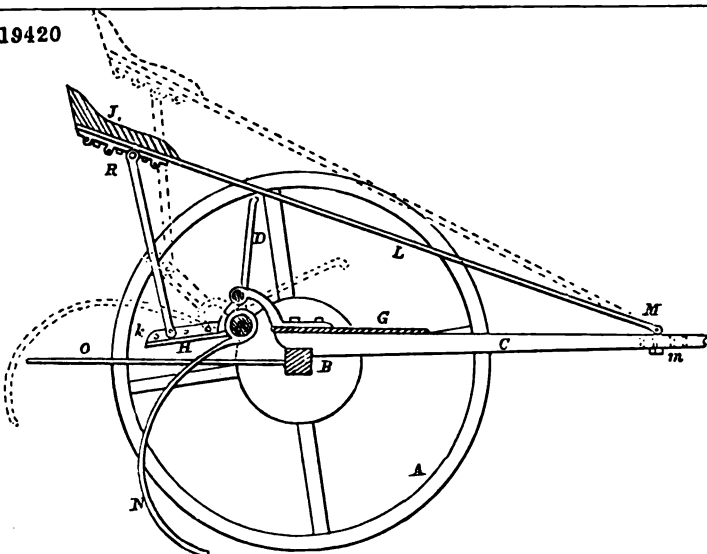
21664



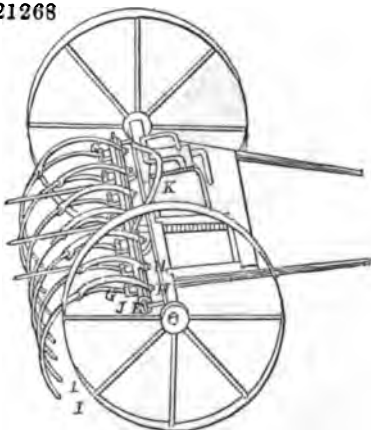
21712



19420



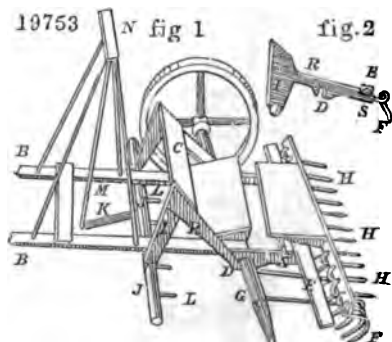
21268



19753

N fig 1

fig. 2



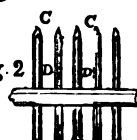
22232



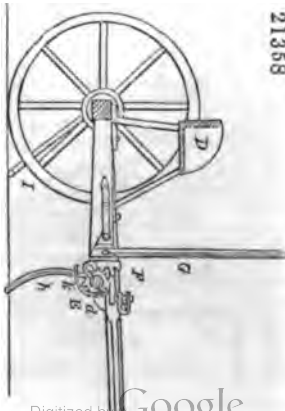
22235



fig. 2



21358



19367

fig. 1

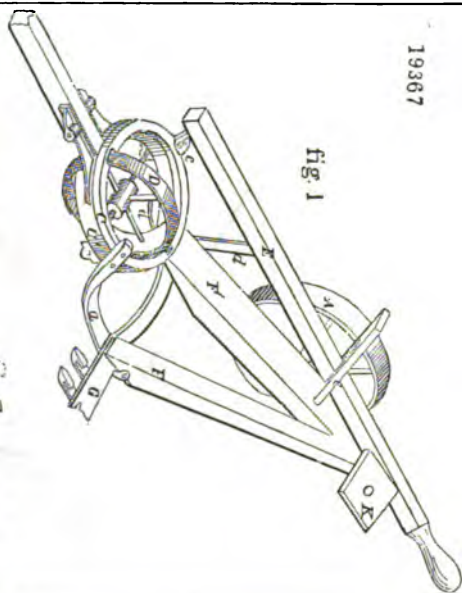
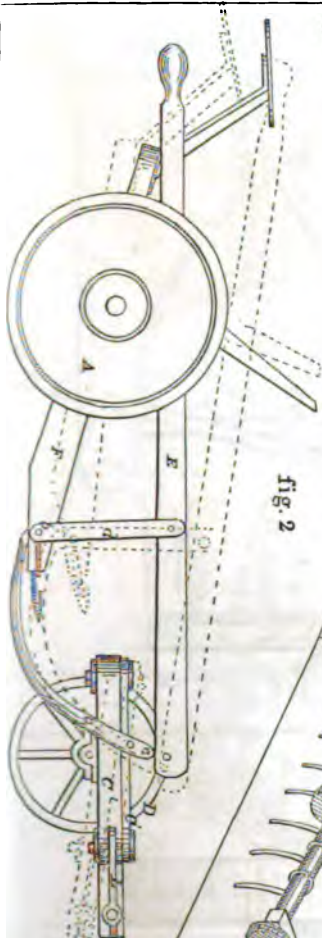
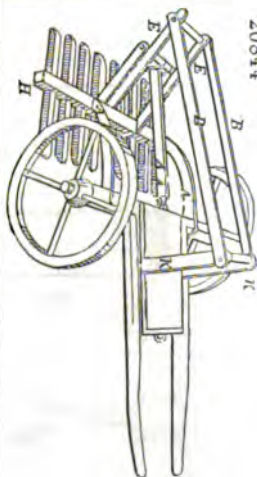


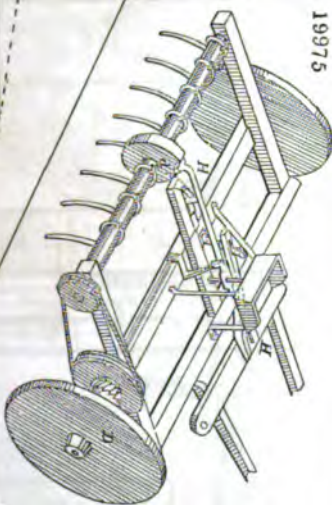
fig. 2



20844



19975



19687

fig. 1

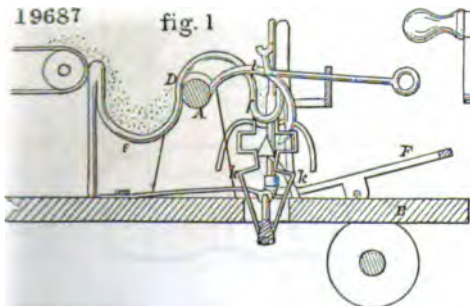
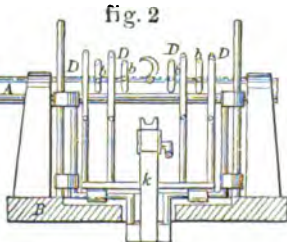


fig. 2



19118

fig. 1

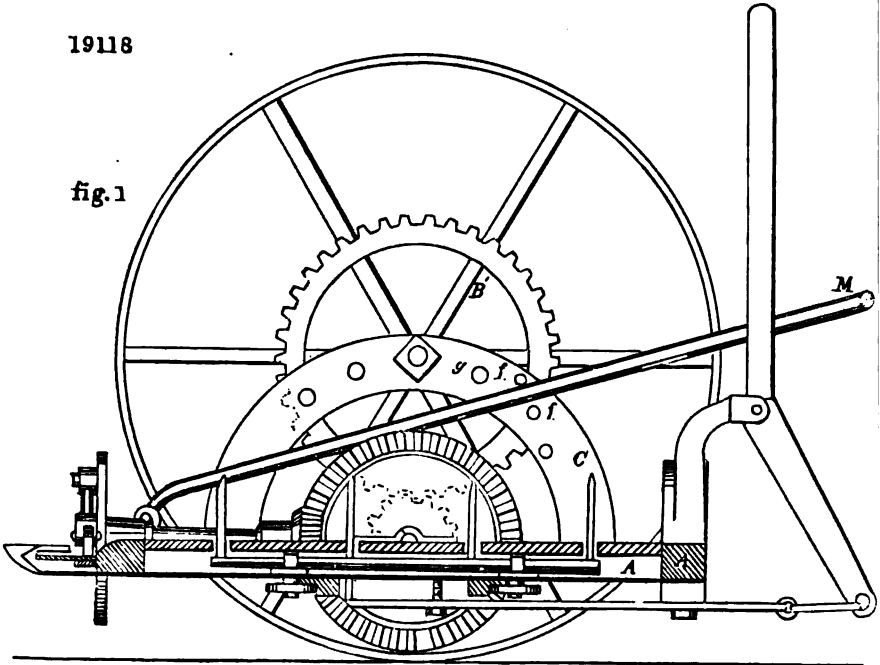
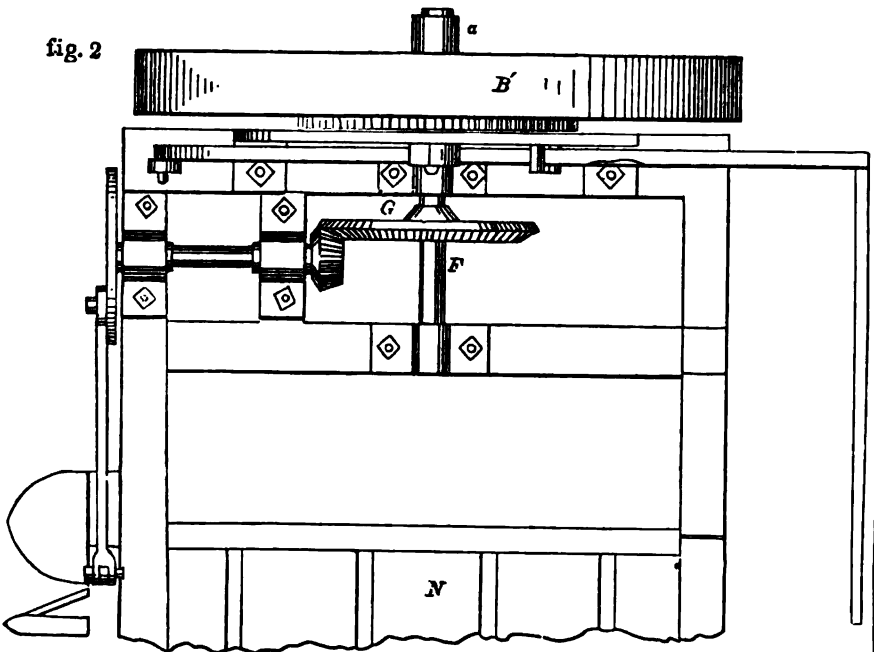
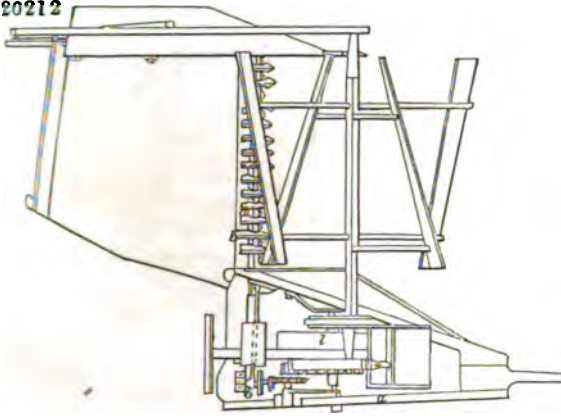


fig. 2





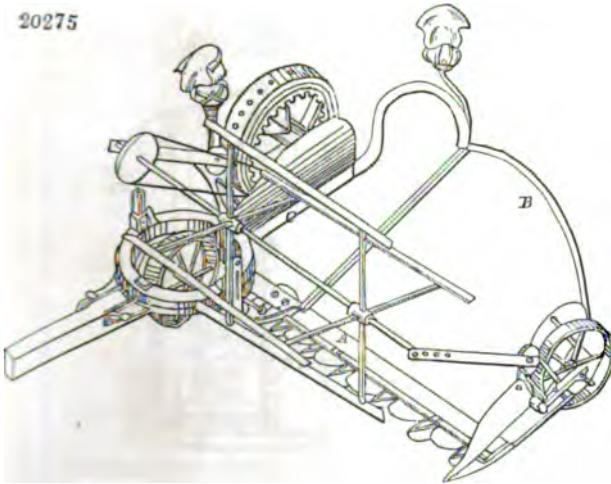
20212



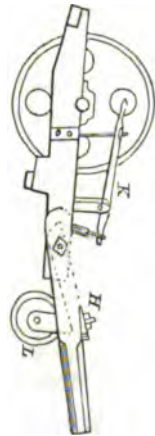
19804



20275



20887



19894

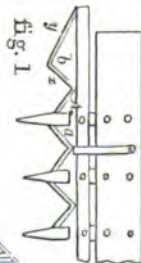
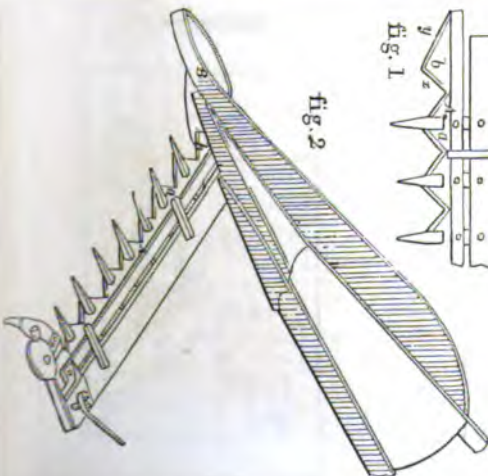
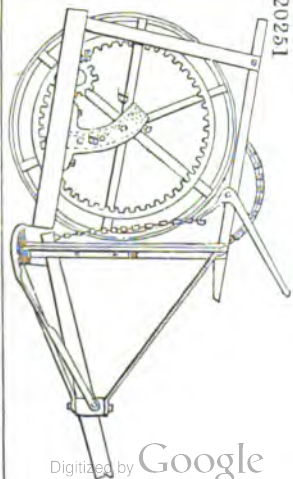


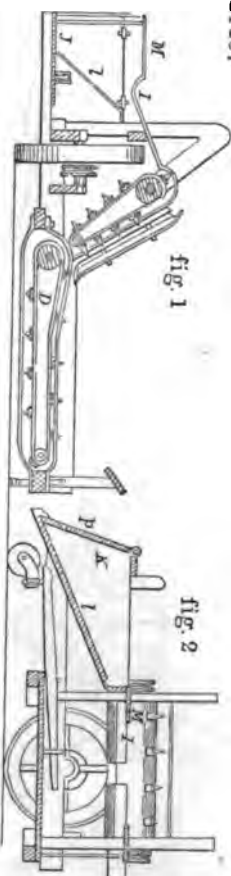
fig. 2



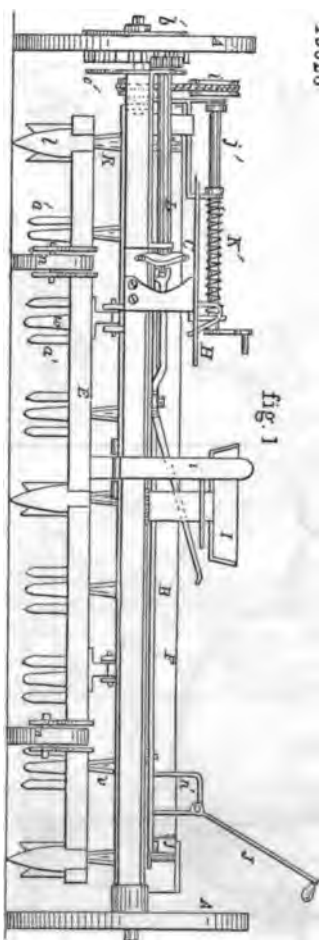
20251



21207



19020



21434

fig. 1

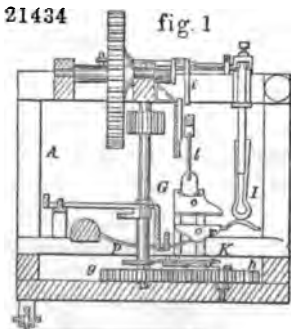
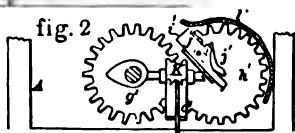
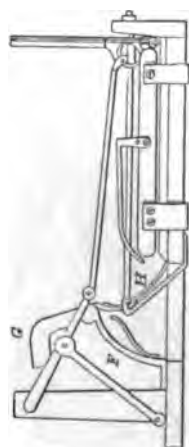


fig. 2



20017



19144

fig. 1

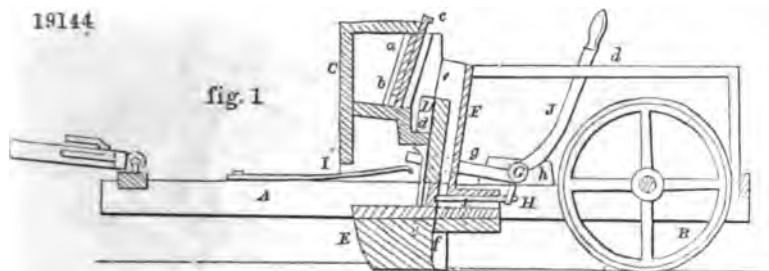


fig. 2

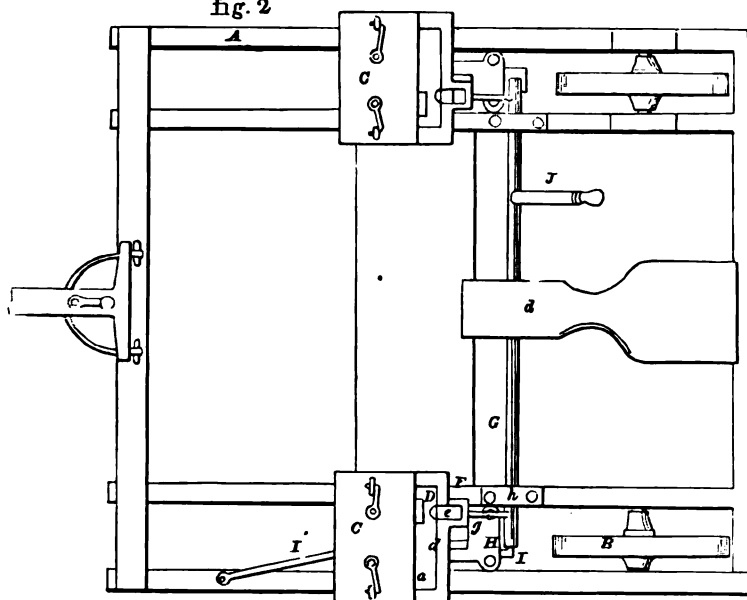


fig. 1

19333

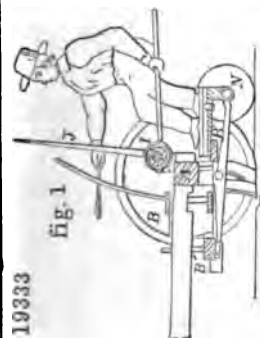
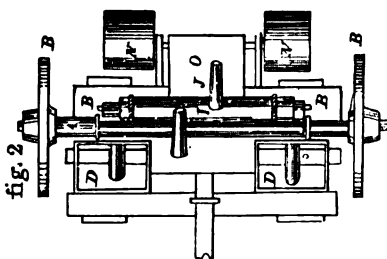
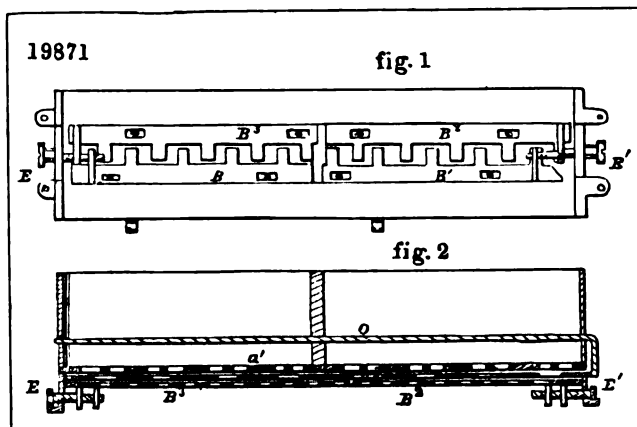
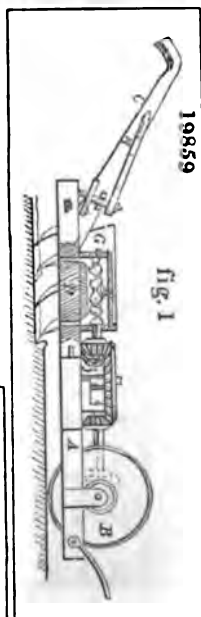
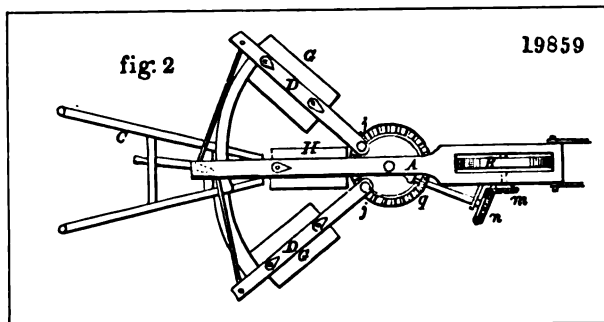
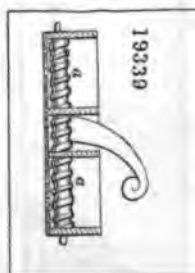
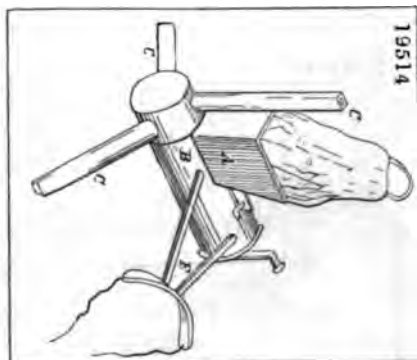
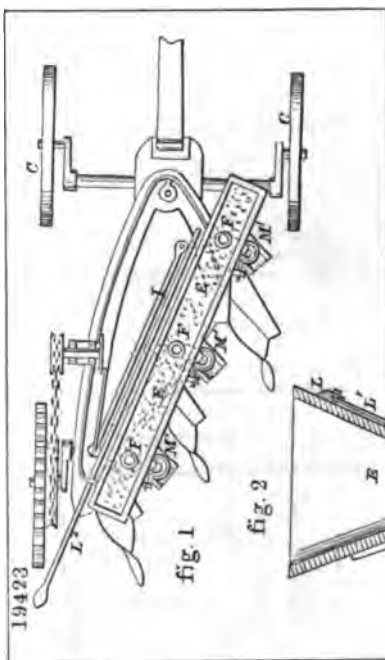


fig. 2







19902

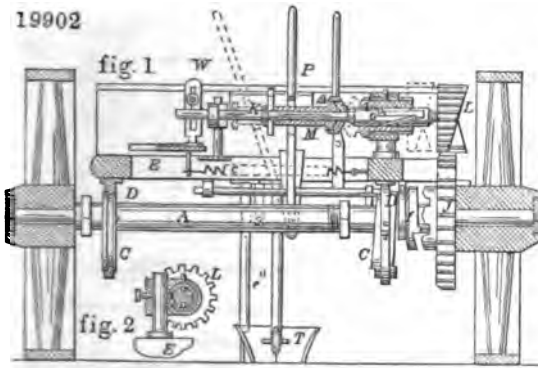
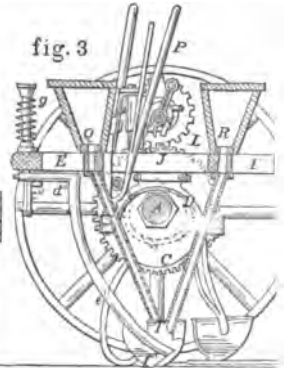


fig. 3



19872

fig. 1

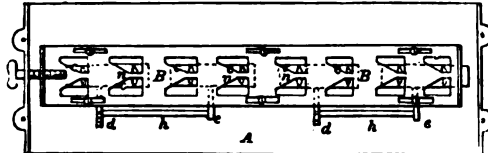
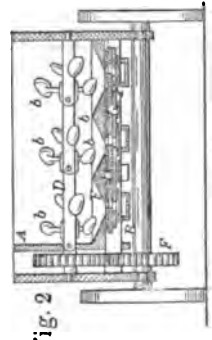
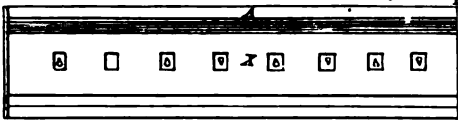


fig. 2

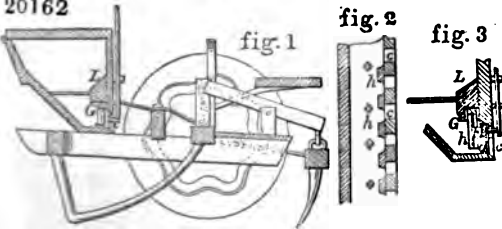


20162

fig. 1

fig. 2

fig. 3



20357

fig. 1

20301

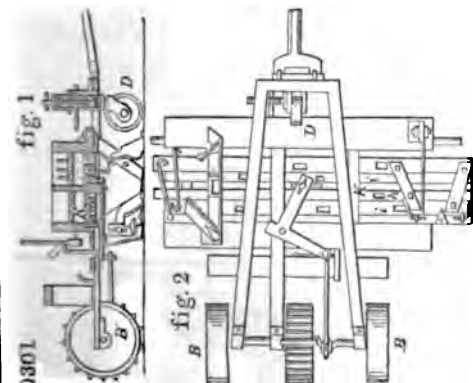
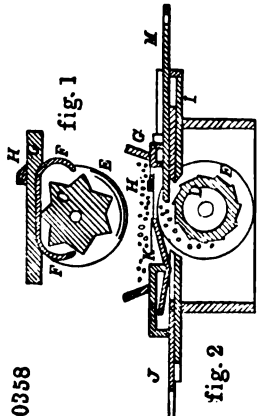


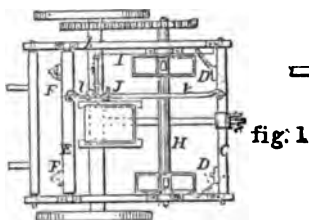
fig. 1

fig. 2

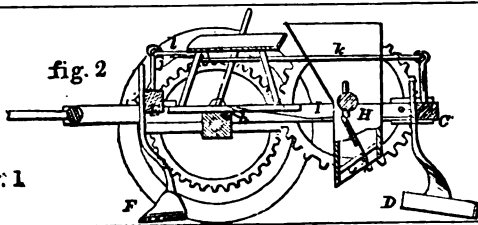


20358

20366

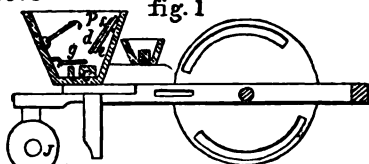


**fig. 2**

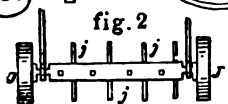


**20575**

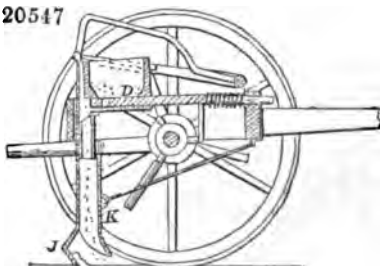
fig. 1



**fig. 2**



20547

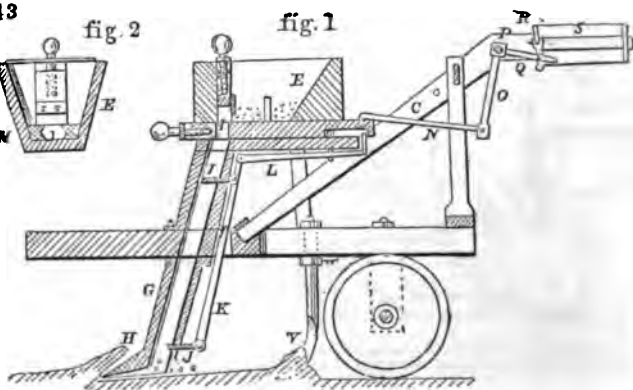


**20643**

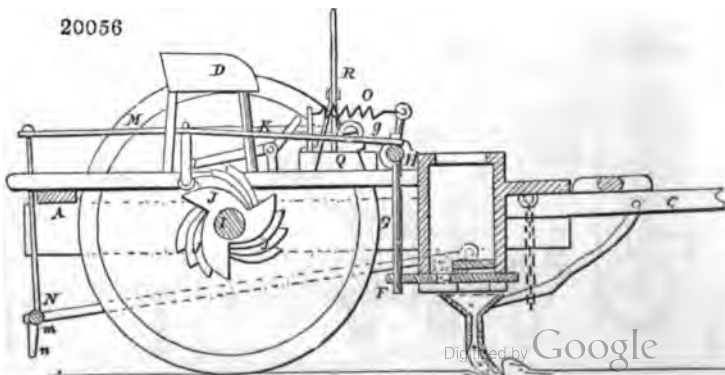
fig. 2

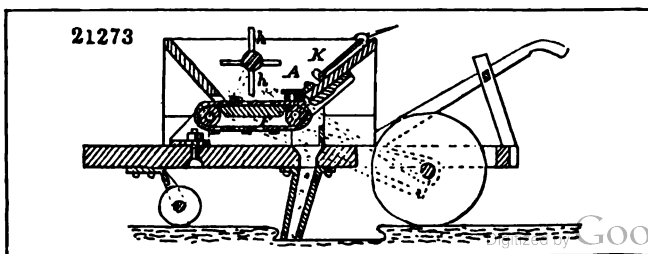
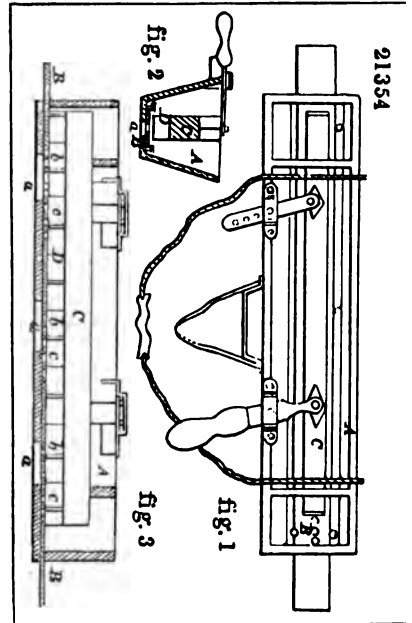
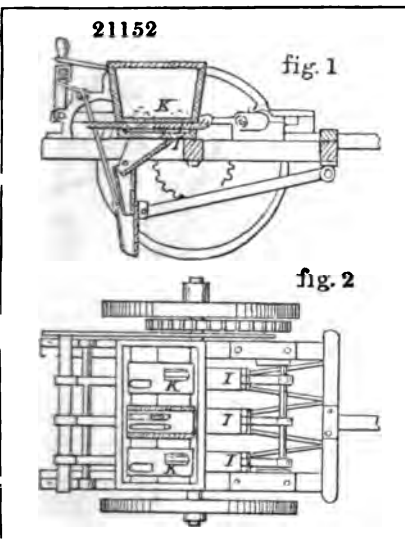
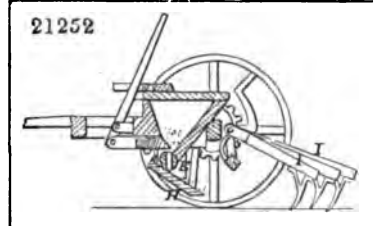
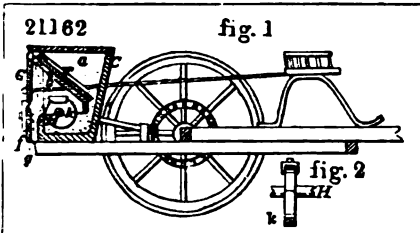
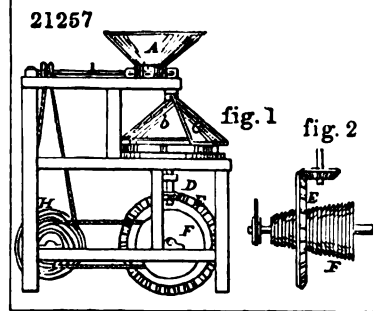
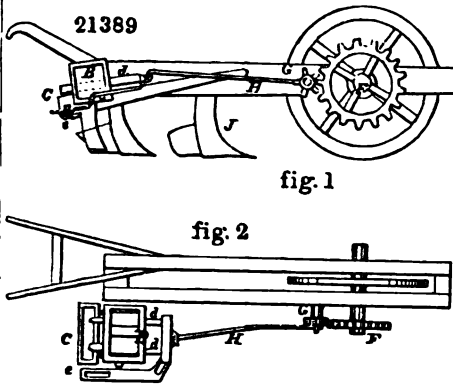


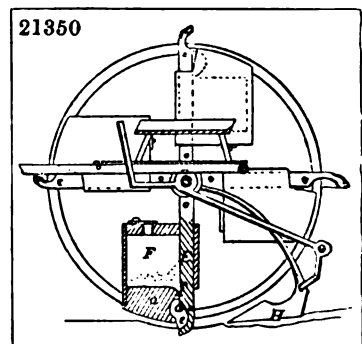
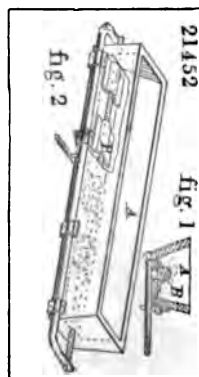
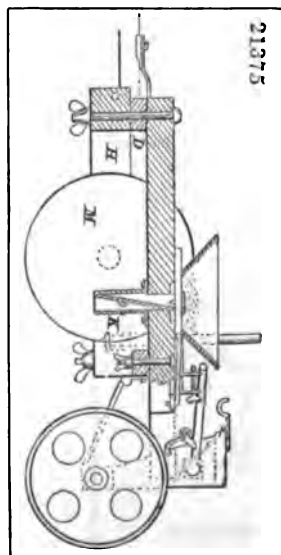
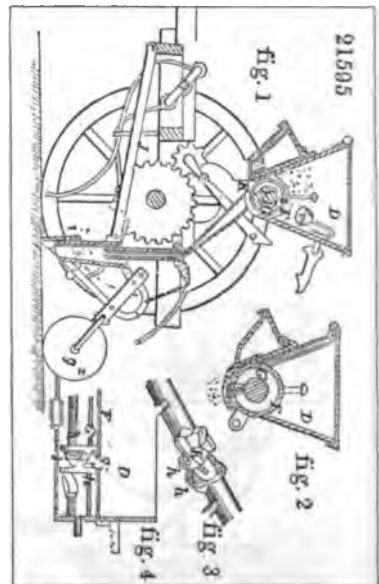
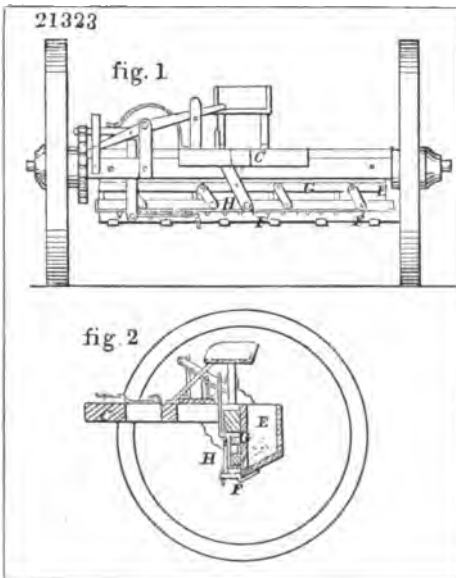
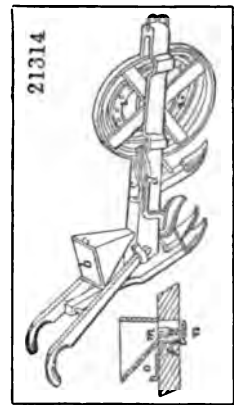
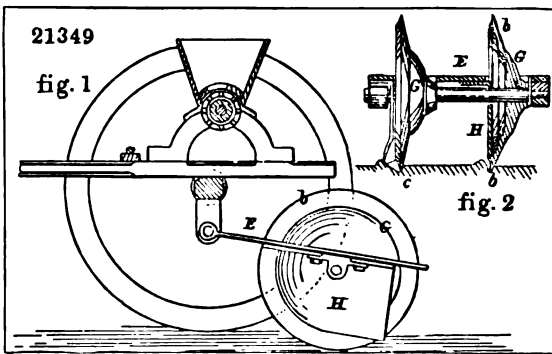
fig. 1



20056







21780

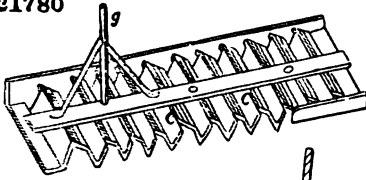
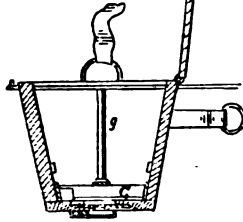


fig. 1

fig 2



21807

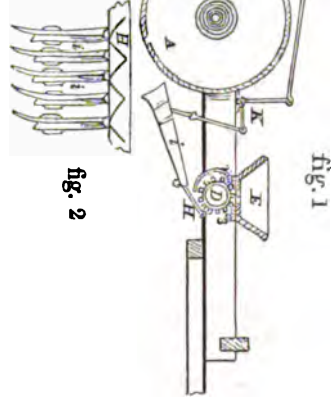


fig. 2

fig. 1

21969

fig. 1

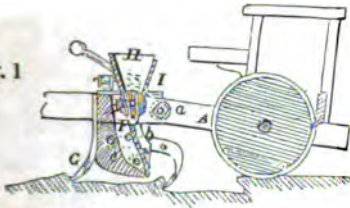
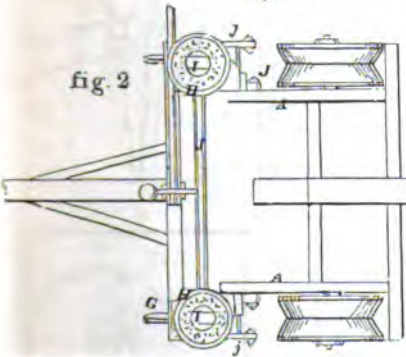


fig 2



21850

fig. 1

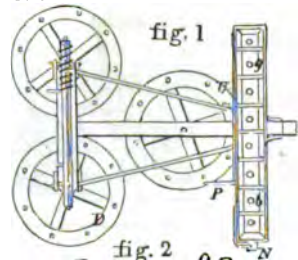
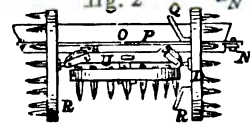


fig. 2



21995

fig. 1

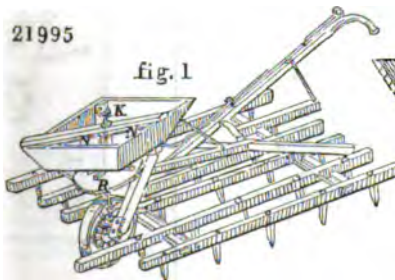
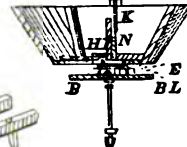


fig. 2



21958

fig. 1

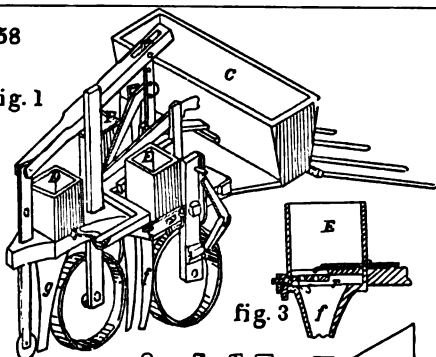


fig. 3

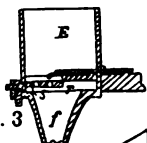
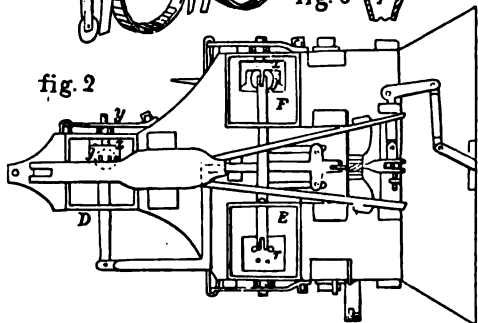
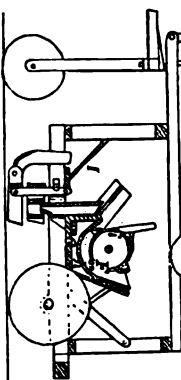


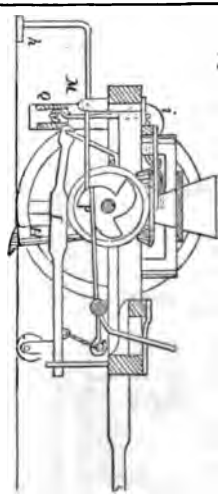
fig. 2



22184



21959



22208

fig. 1

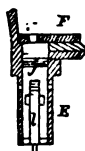
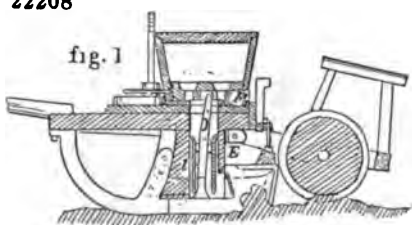


fig. 2

22180

fig. 1

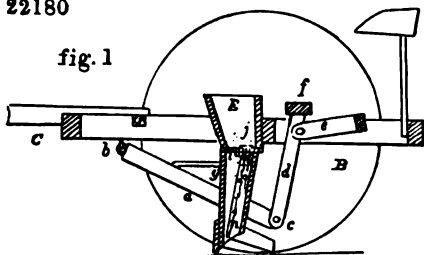
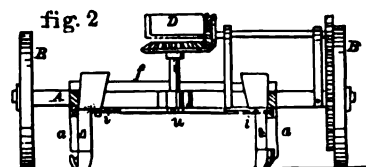
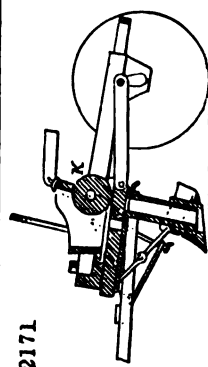
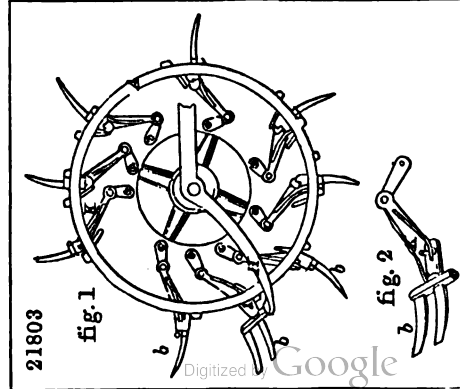
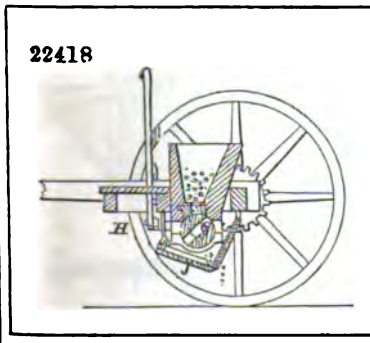
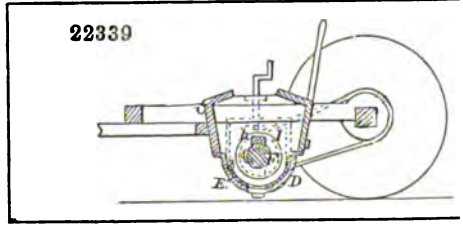
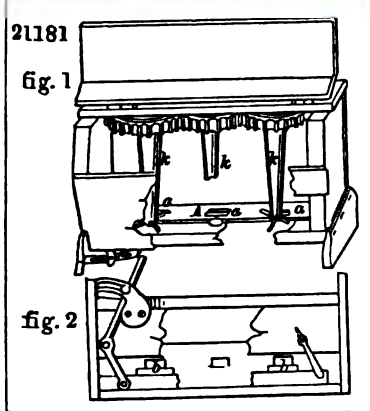
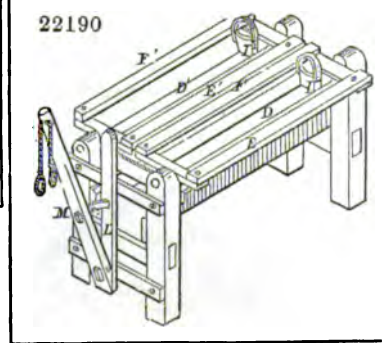
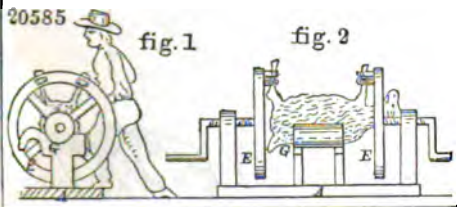
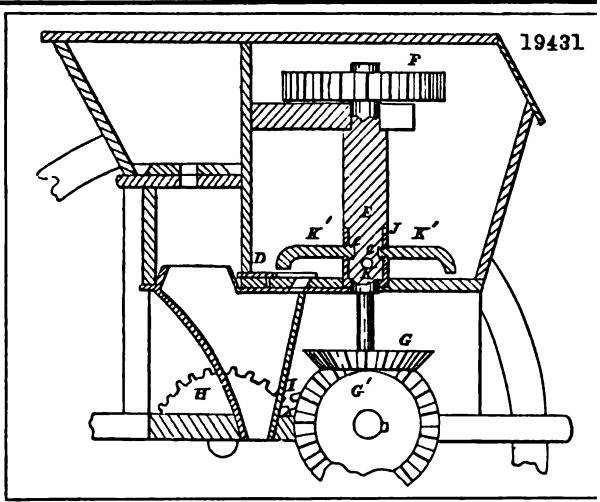
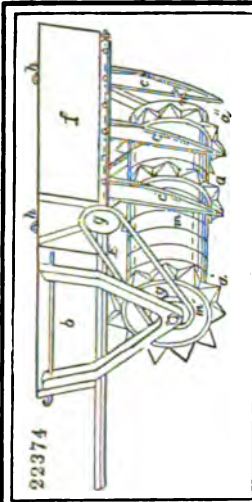


fig. 2

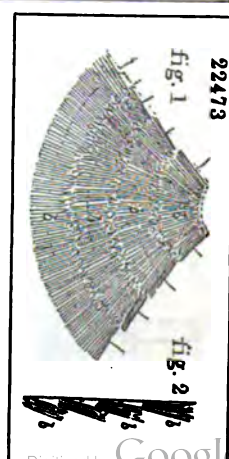
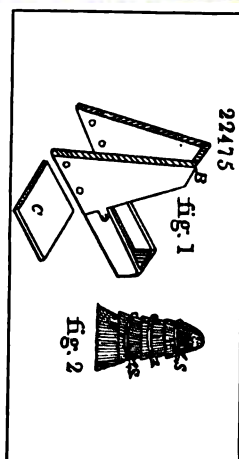
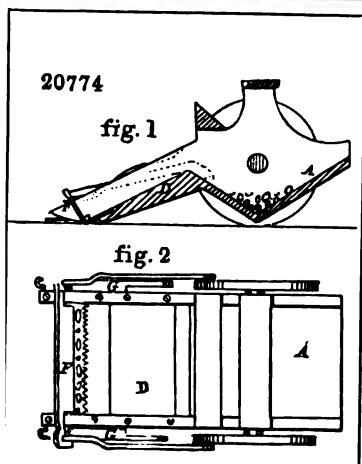
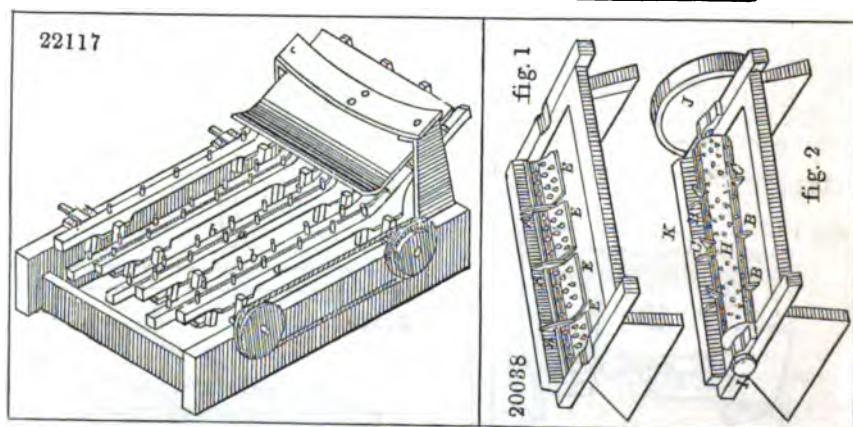
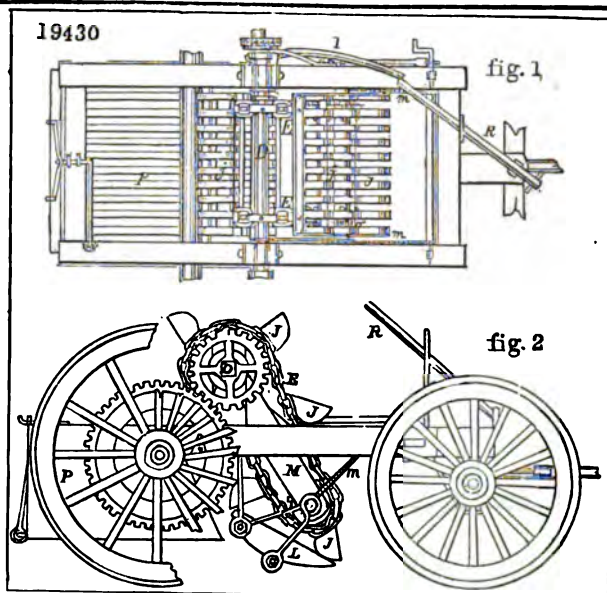


22171









19425

fig. 1

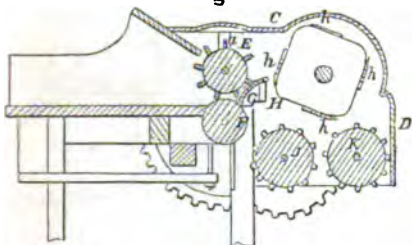
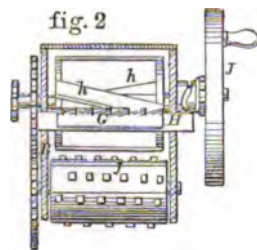


fig. 2



19200

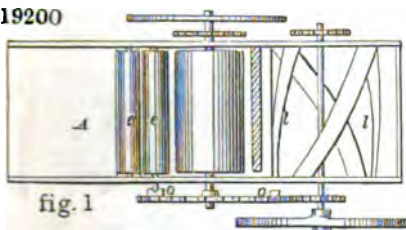
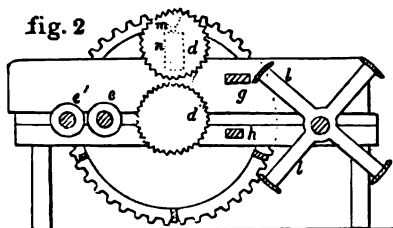


fig. 1

fig. 2



19352

fig. 1

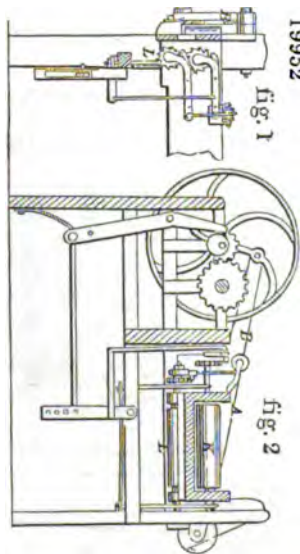


fig. 2

19462

fig. 1

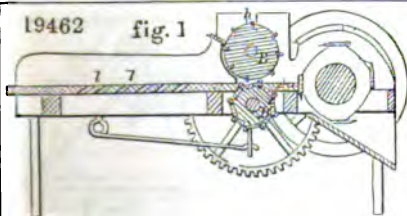
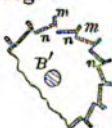


fig. 2



19779

fig. 1

fig. 2

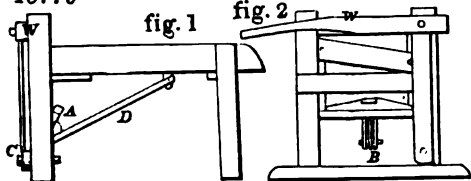
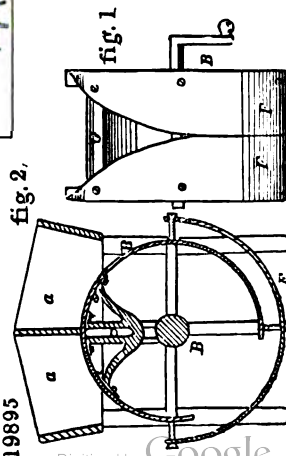


fig. 2,



19895

20103

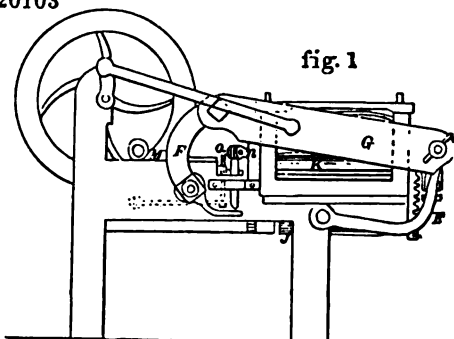


fig. 1

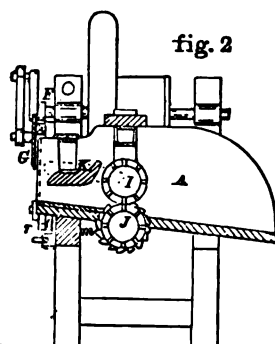


fig. 2

20224

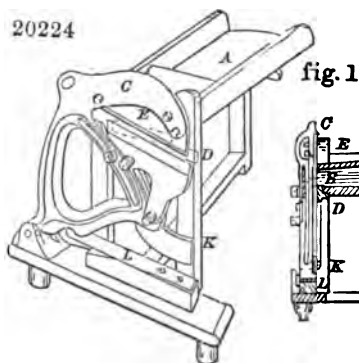


fig. 1

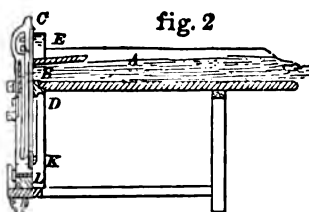
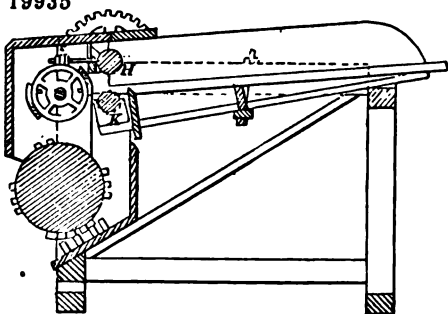


fig. 2

19935



20958

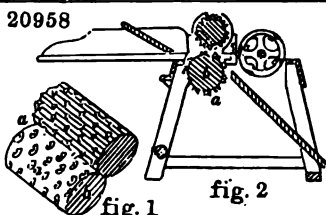


fig. 1

fig. 2

20582

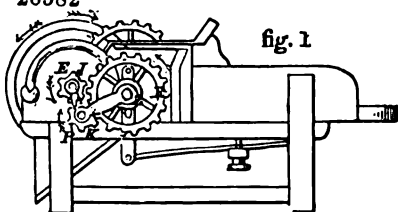


fig. 1

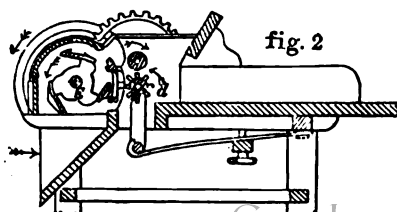
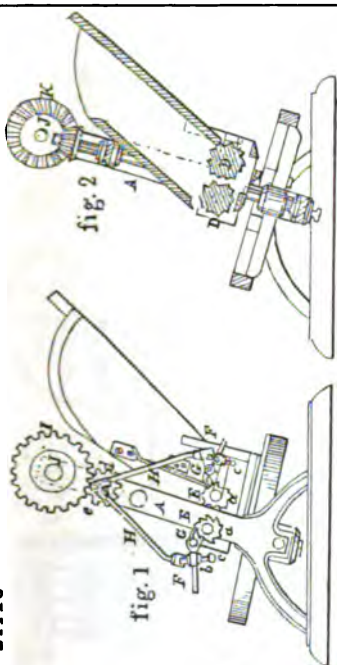
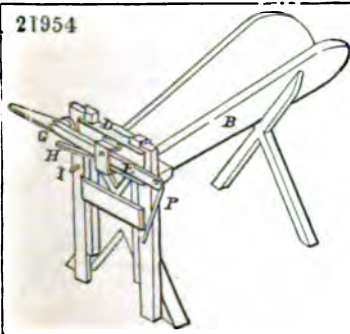


fig. 2

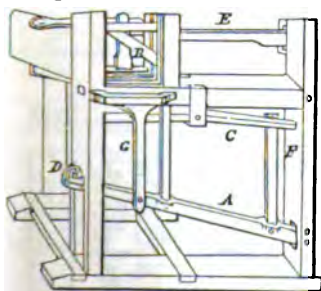
21110



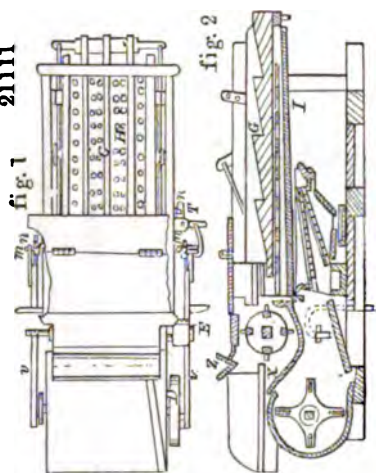
21954



22072



21111



22336 fig. 1

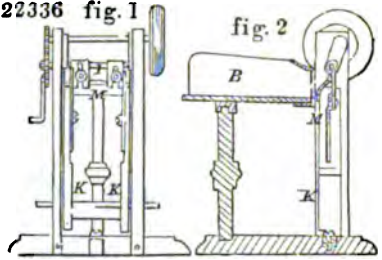
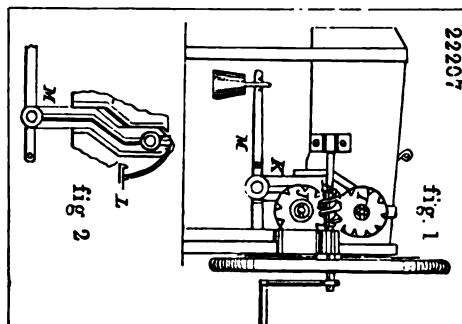
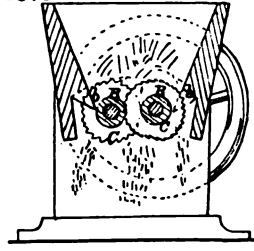


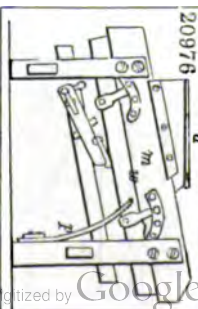
fig. 2

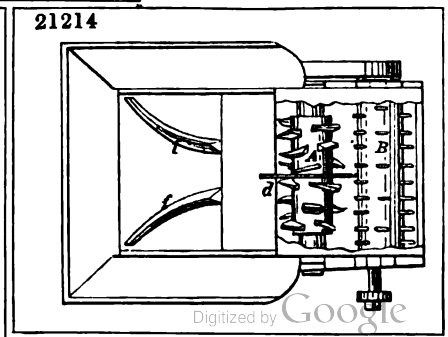
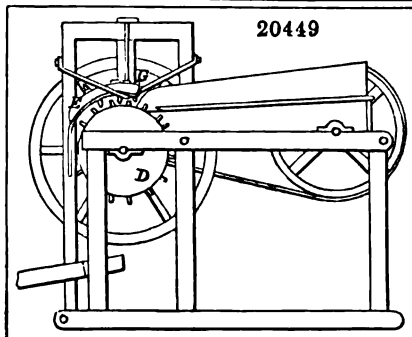
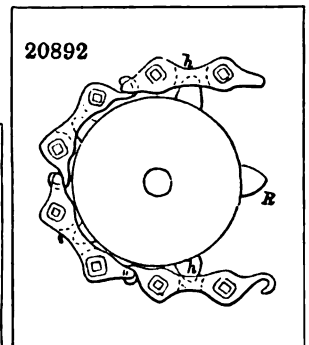
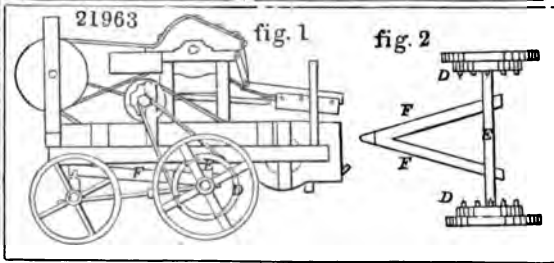
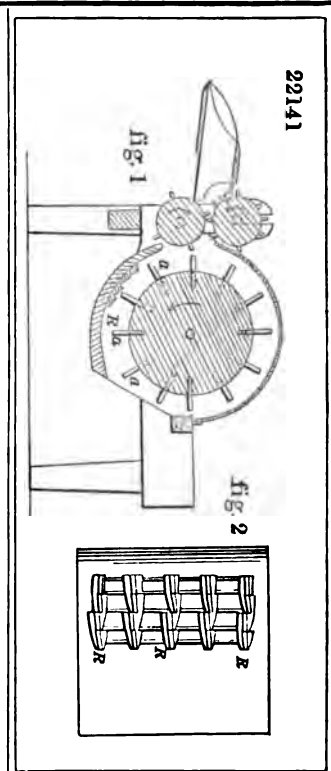
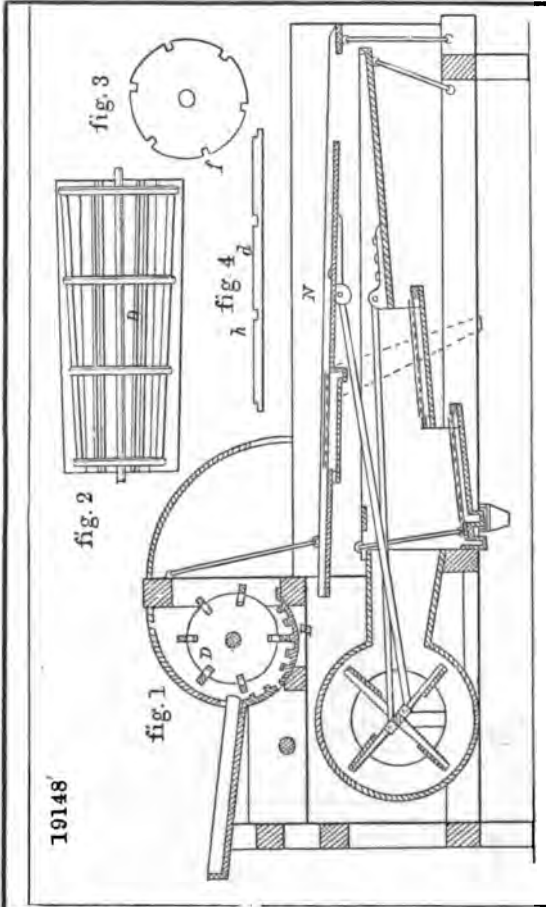


21970

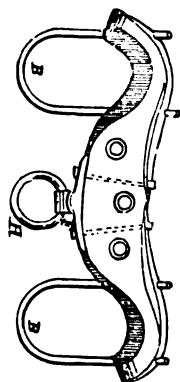
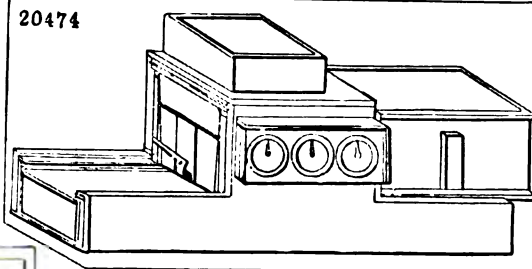
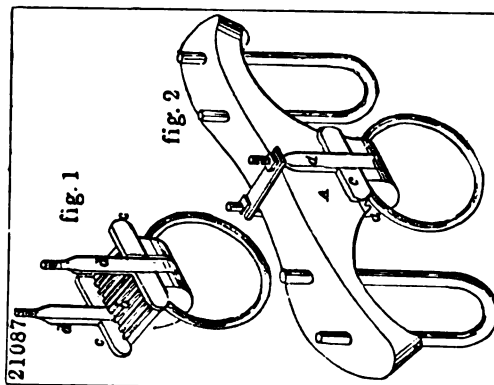
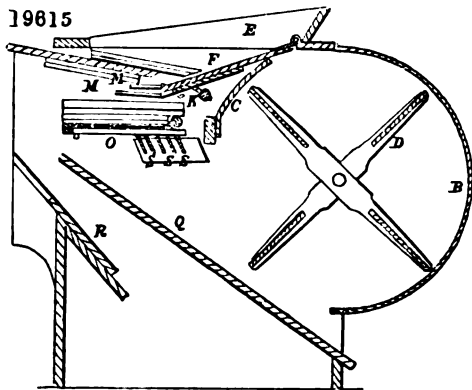
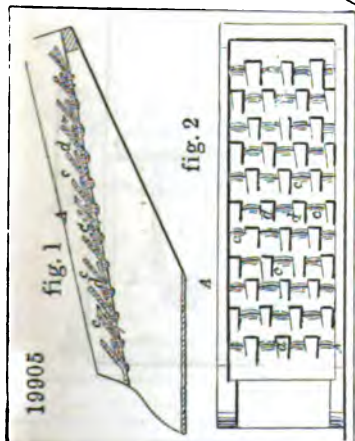
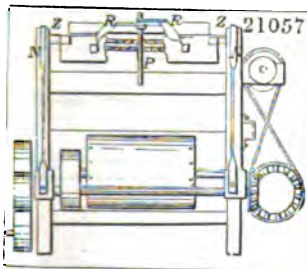
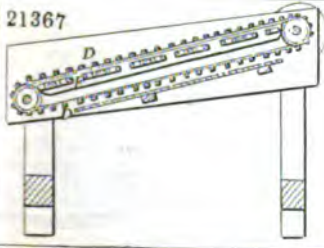
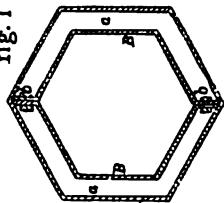
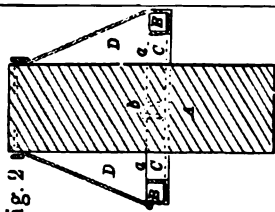


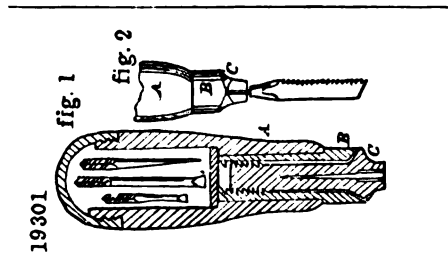
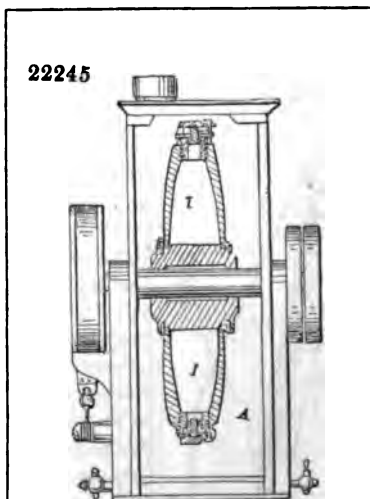
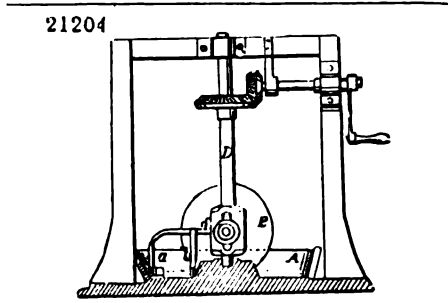
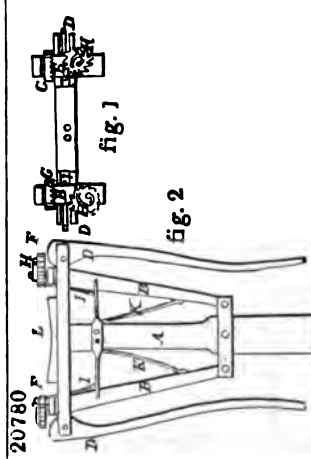
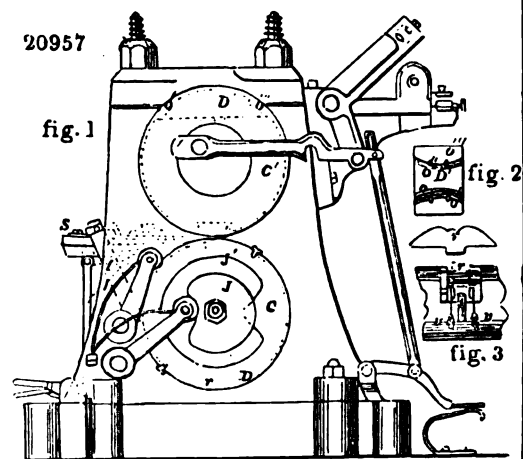
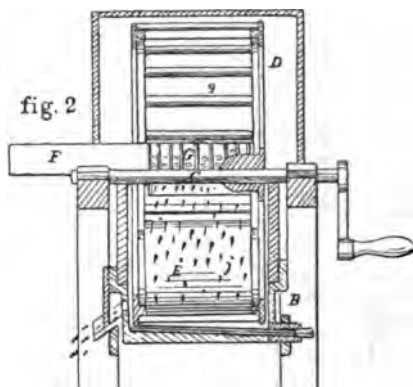
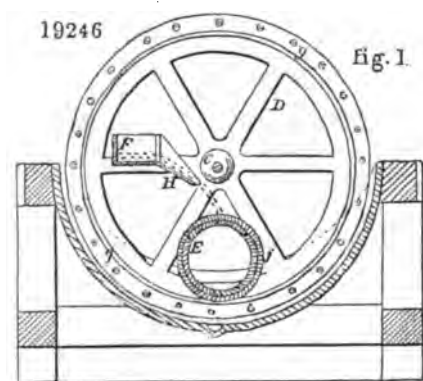
20976



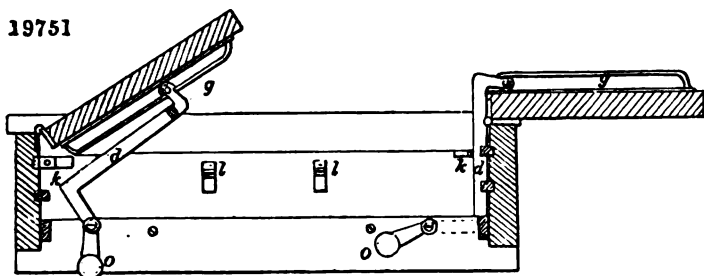








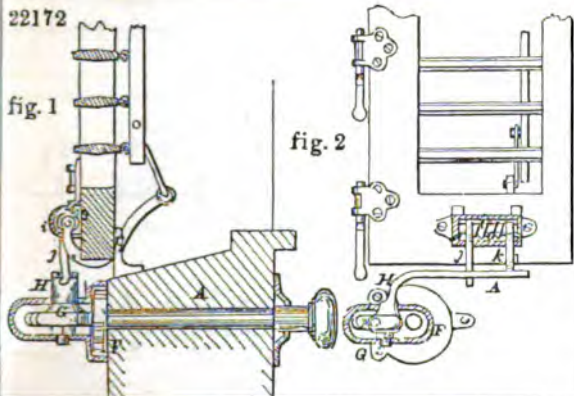
19751



22172

fig. 1

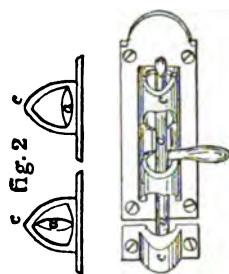
fig. 2



19891

fig. 2

fig. 1

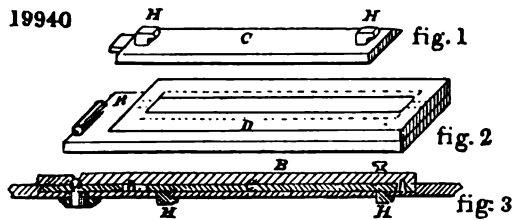


19940

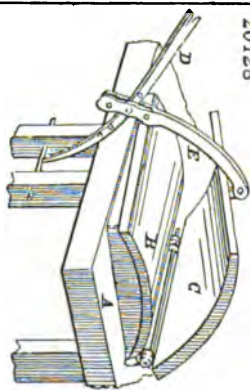
fig. 1

fig. 2

fig. 3



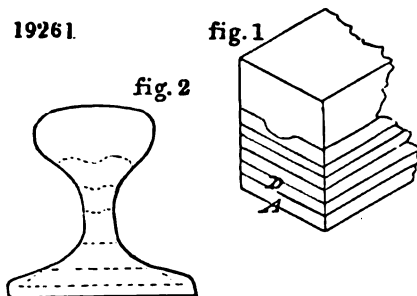
86105



19261

fig. 2

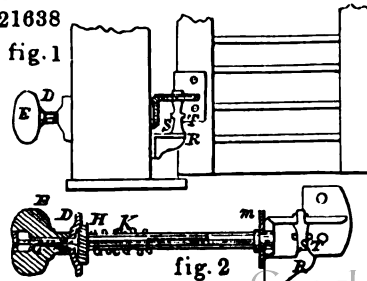
fig. 1



21638

fig. 1

fig. 2





21279

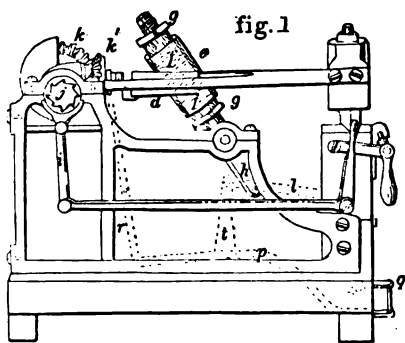
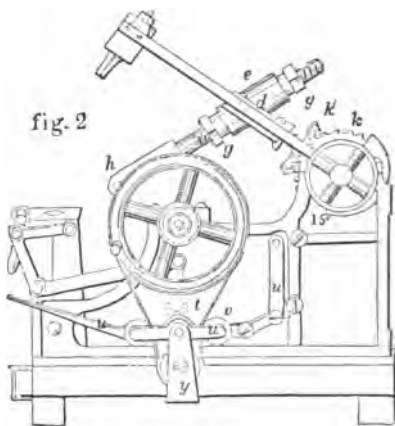


fig. 2



19485

fig. 1

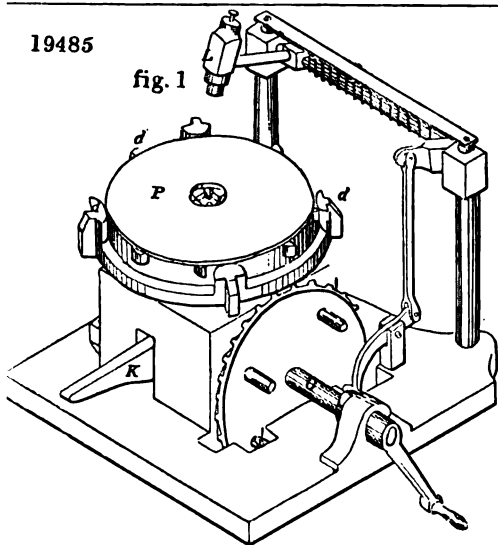
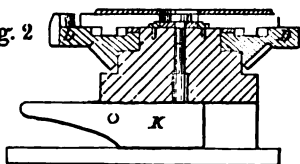


fig. 2



20940

fig. 1

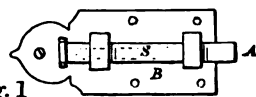
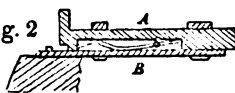


fig. 2



20149

fig. 1

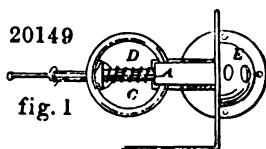
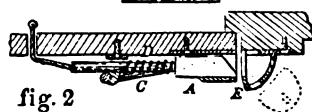


fig. 2



21910

fig. 1

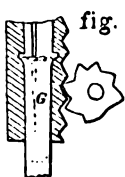
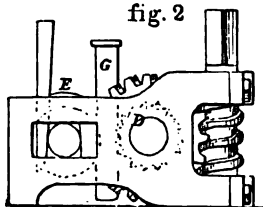
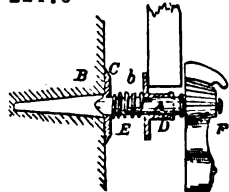


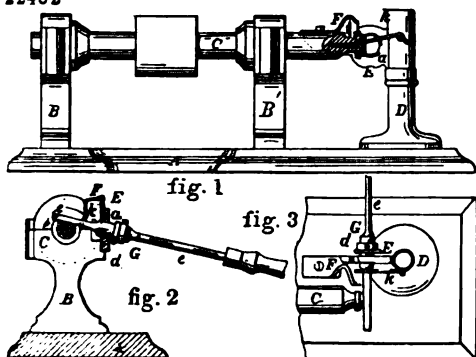
fig. 2



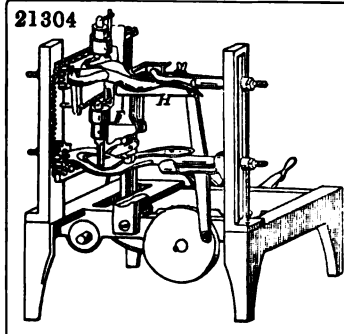
22470



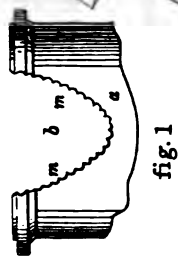
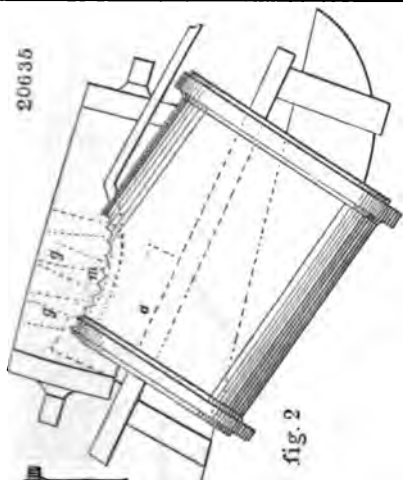
22452



21304



20635



20022

fig. 1

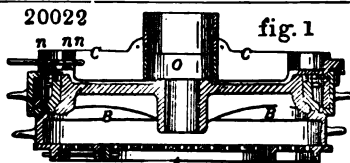
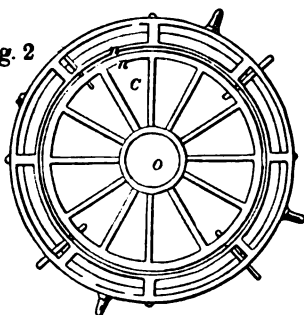
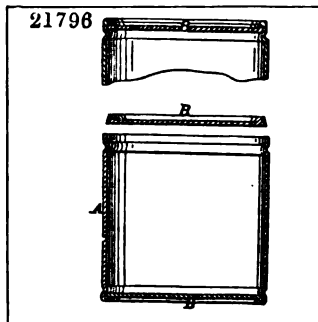


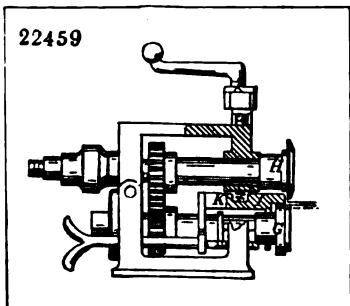
fig. 2



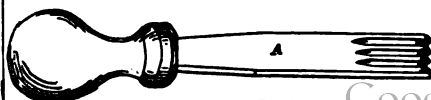
21796



22459



19988



19258

fig. 1

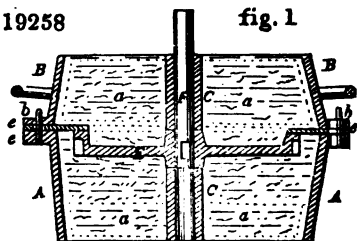
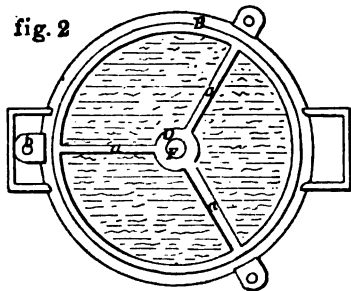
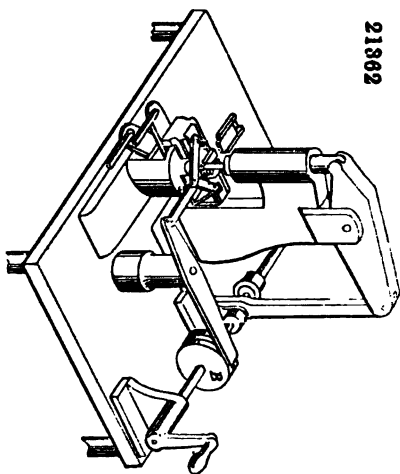


fig. 2



21862



20395

fig. 1

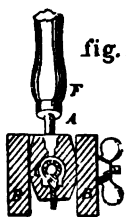
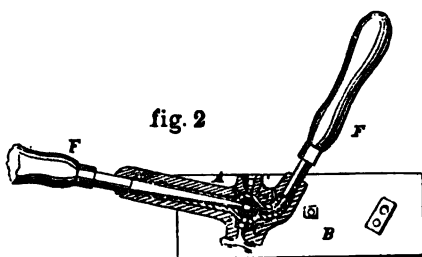


fig. 2



20951

fig. 1

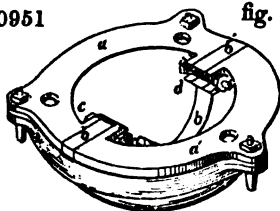
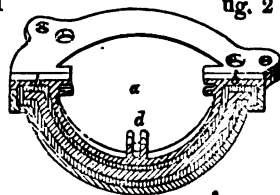
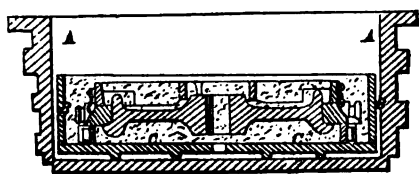


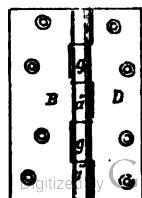
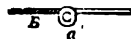
fig. 2



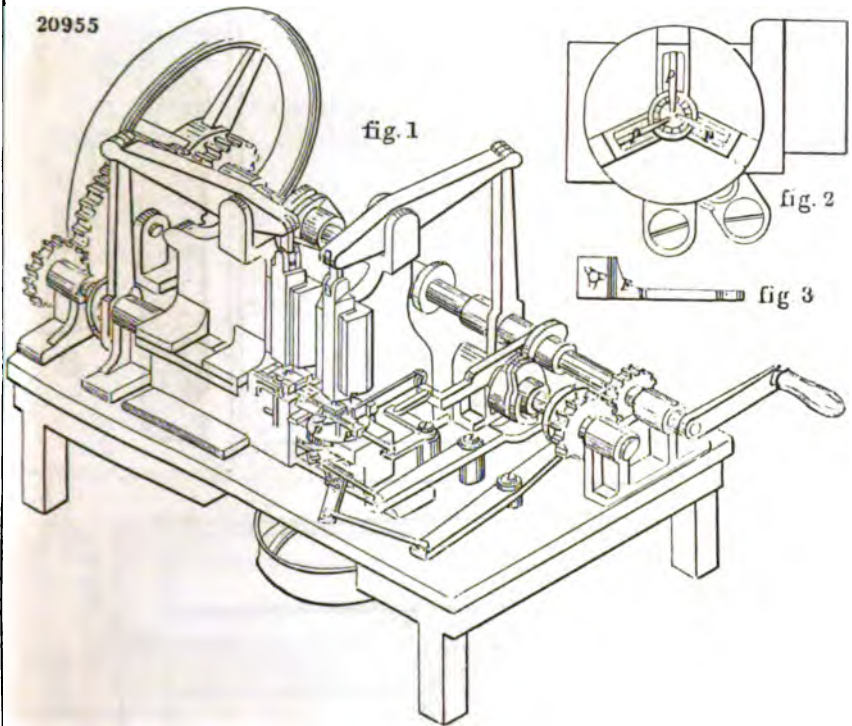
20151



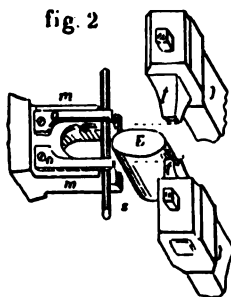
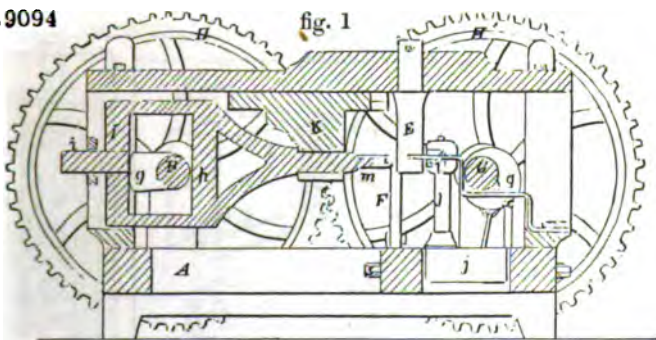
20948



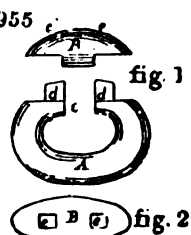
20955



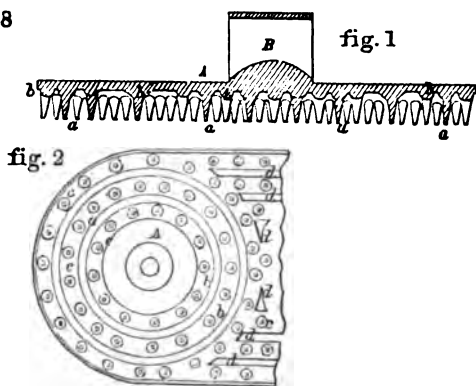
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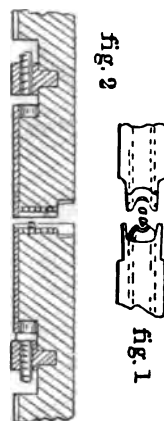
19955



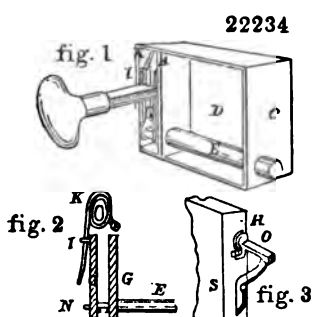
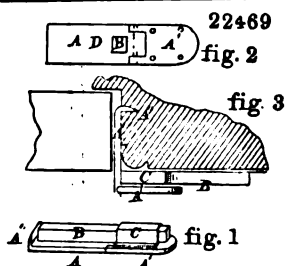
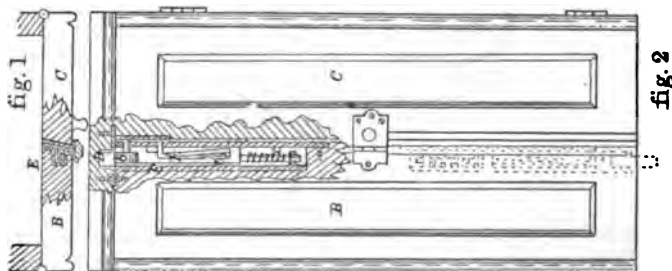
19188



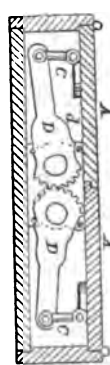
19918



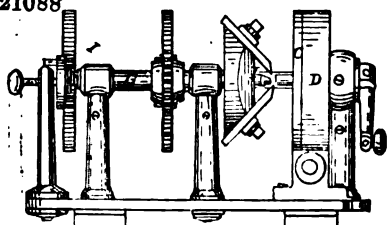
20570



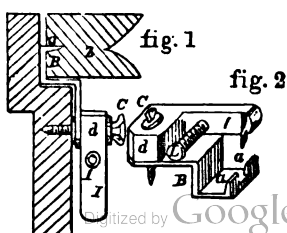
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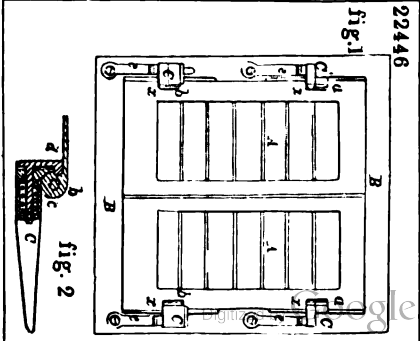
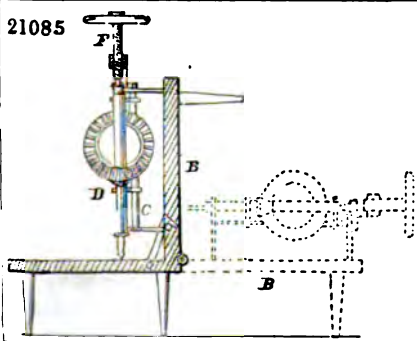
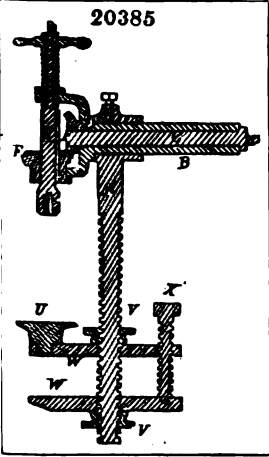
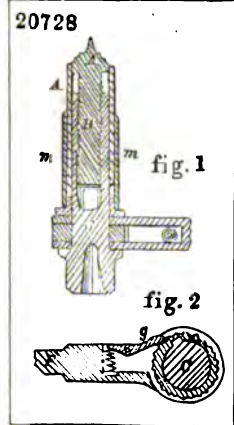
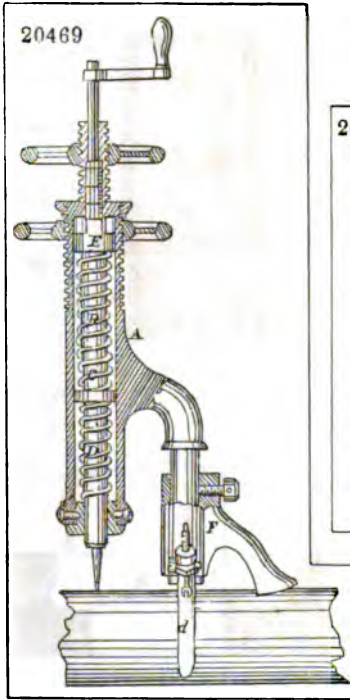
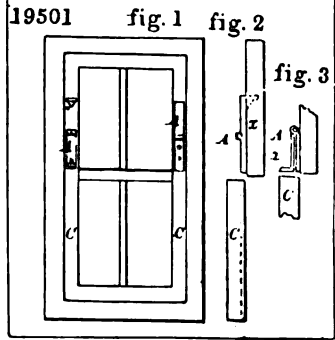
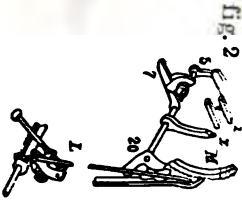
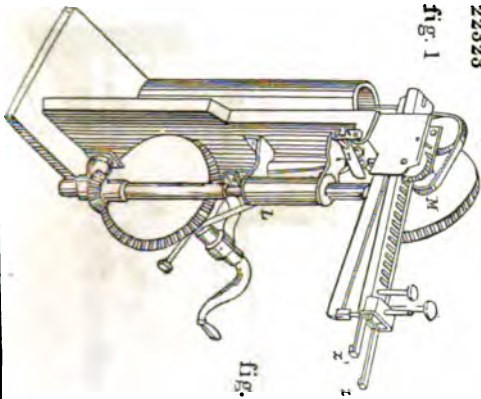


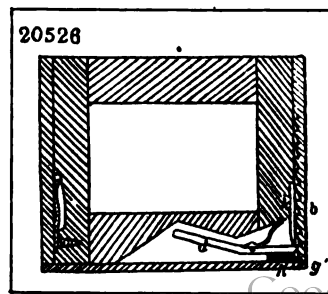
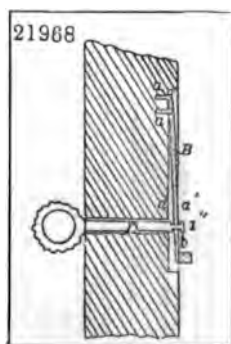
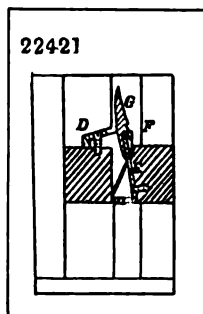
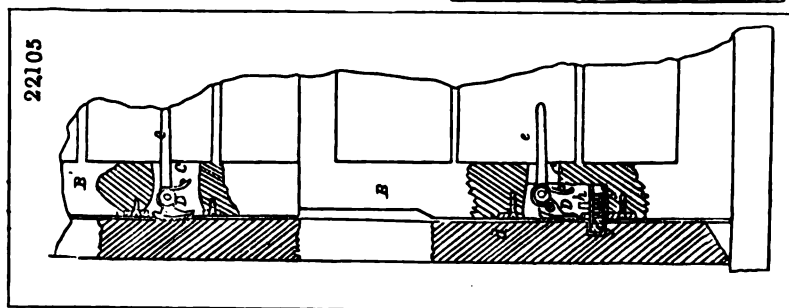
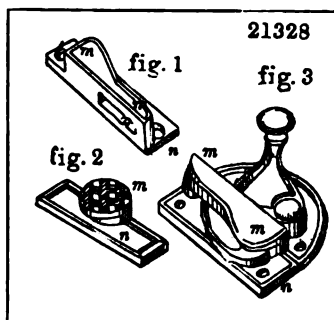
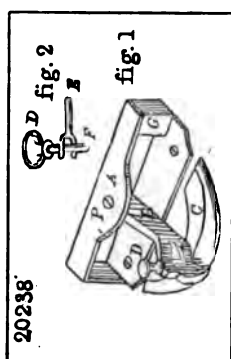
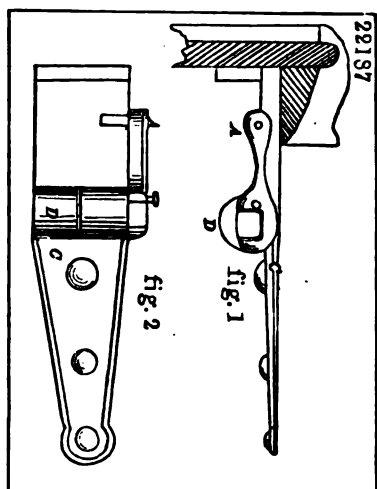
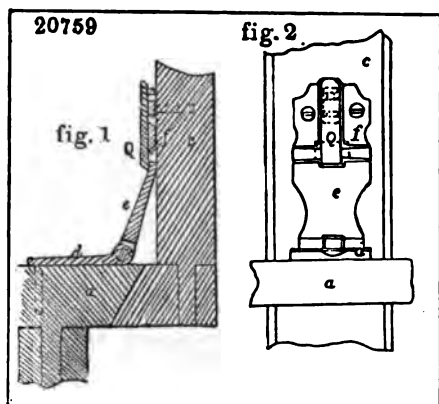
21088



19937



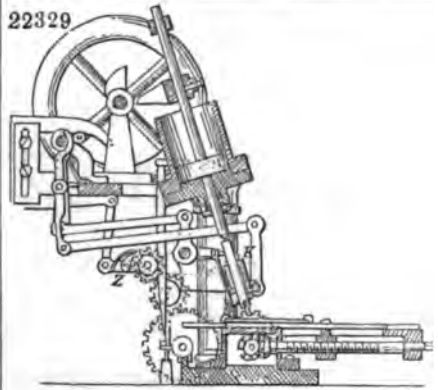




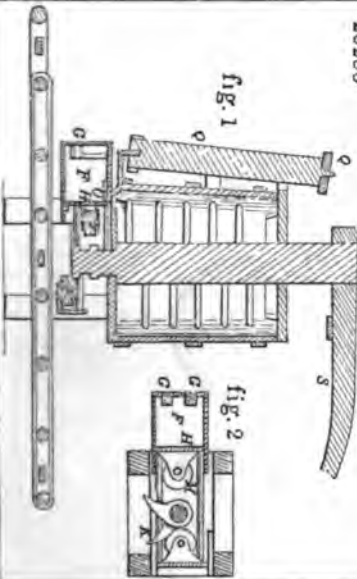
21370



22329



20286



22034  
fig. 1

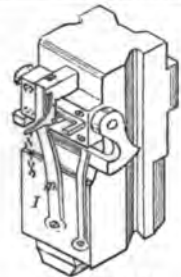
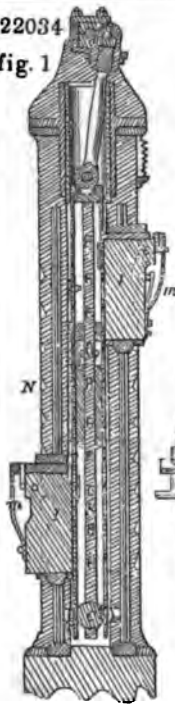
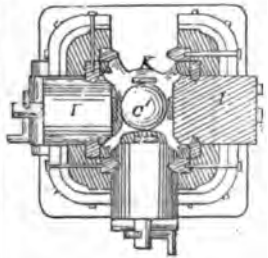


fig. 2

fig. 3



19588

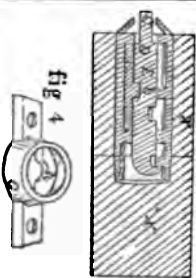


fig. 1

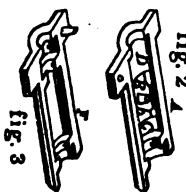


fig. 2

fig. 3

fig. 1

19143

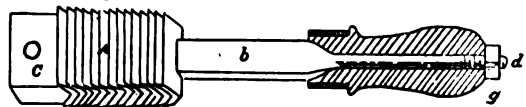


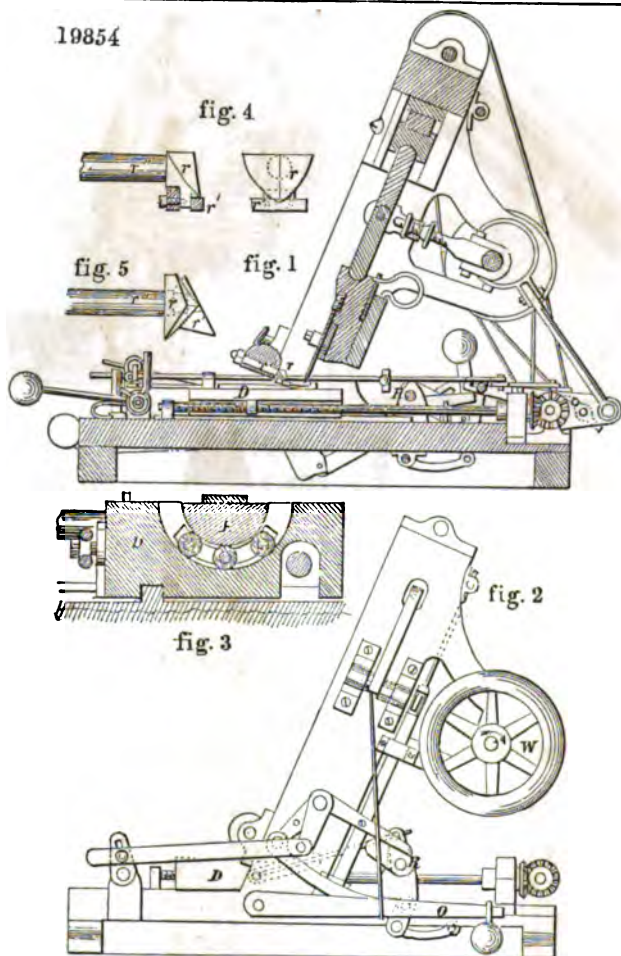
fig. 2



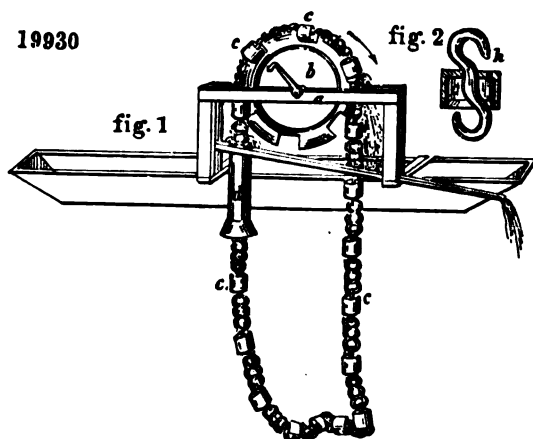
fig. 3

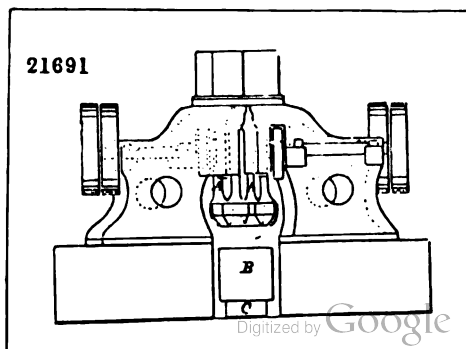
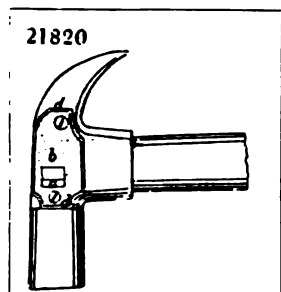
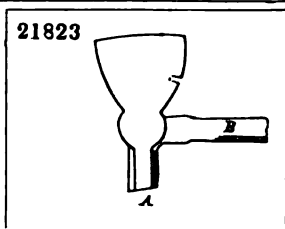
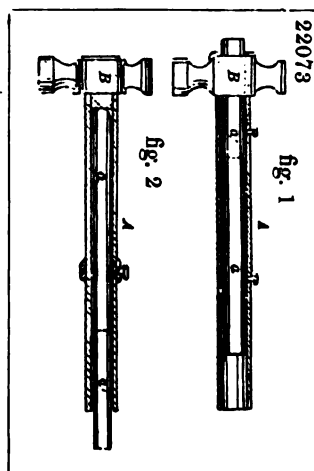
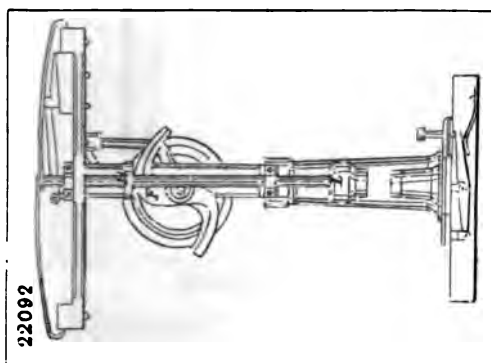
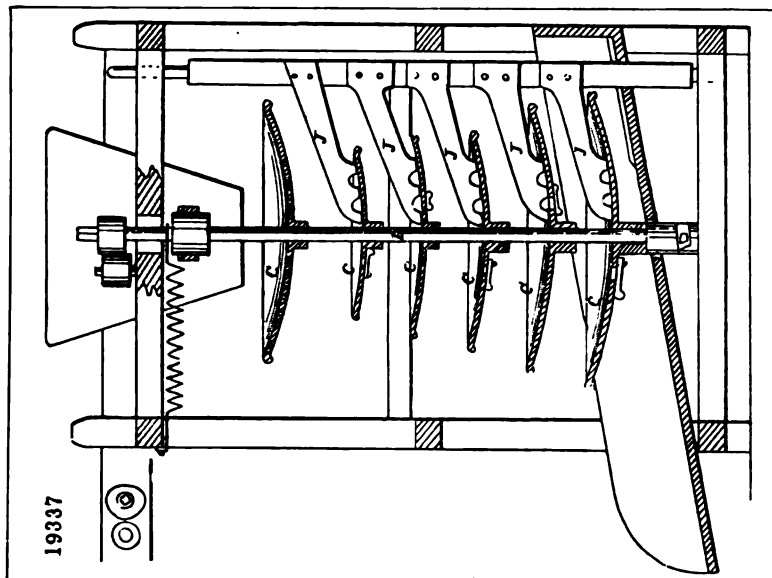


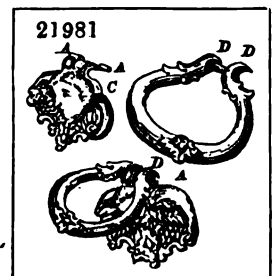
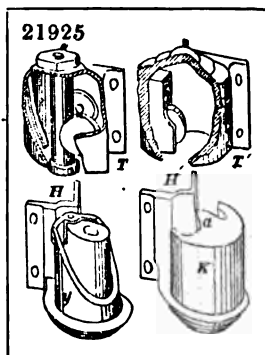
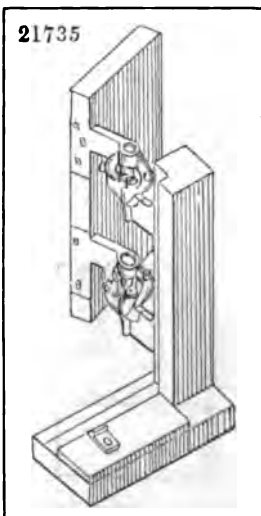
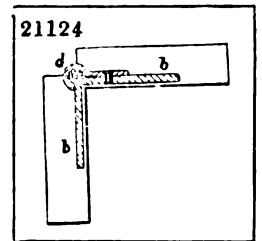
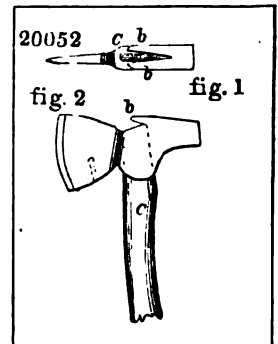
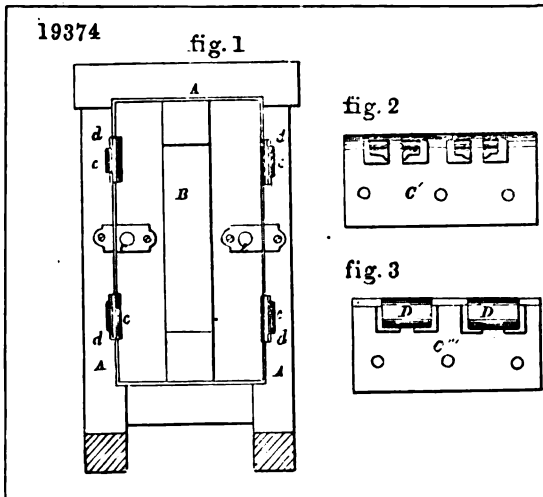
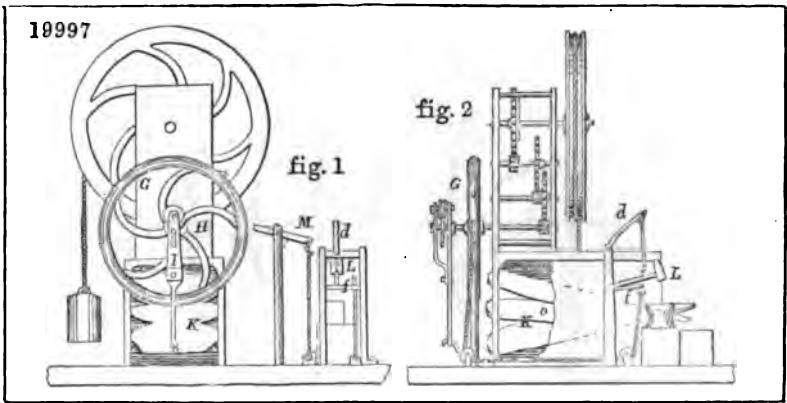
19854



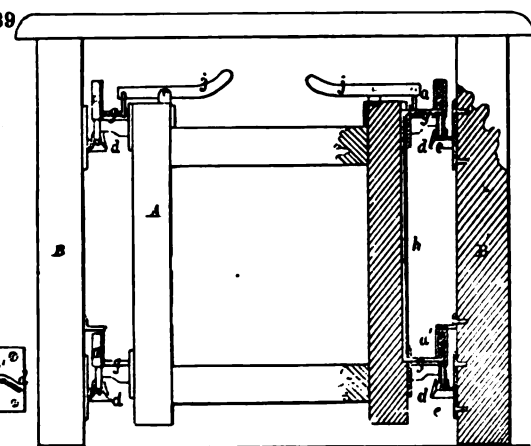
19930







21939



21496

fig. 1

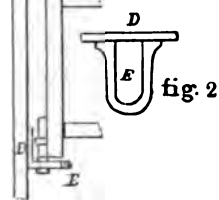


fig. 2

19076

fig. 1

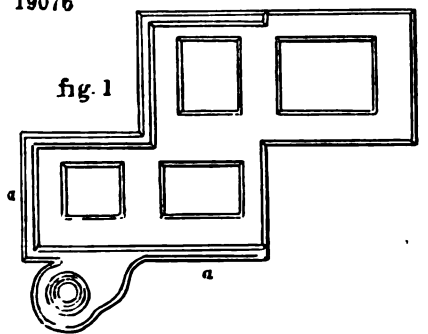
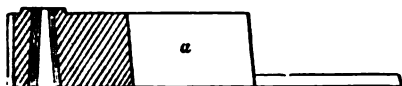


fig. 2



21571

fig. 1

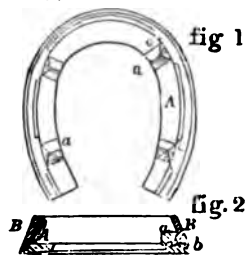
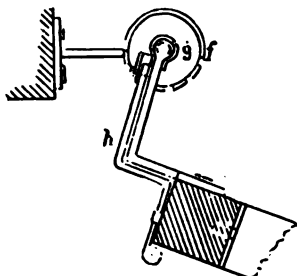


fig. 2

21347



20713



19526



22214

fig. 1

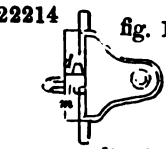
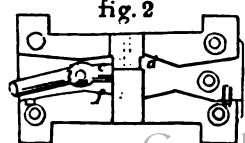
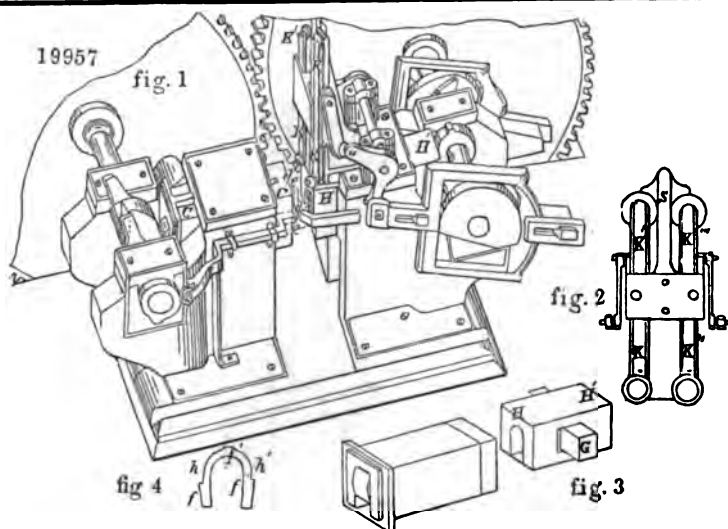
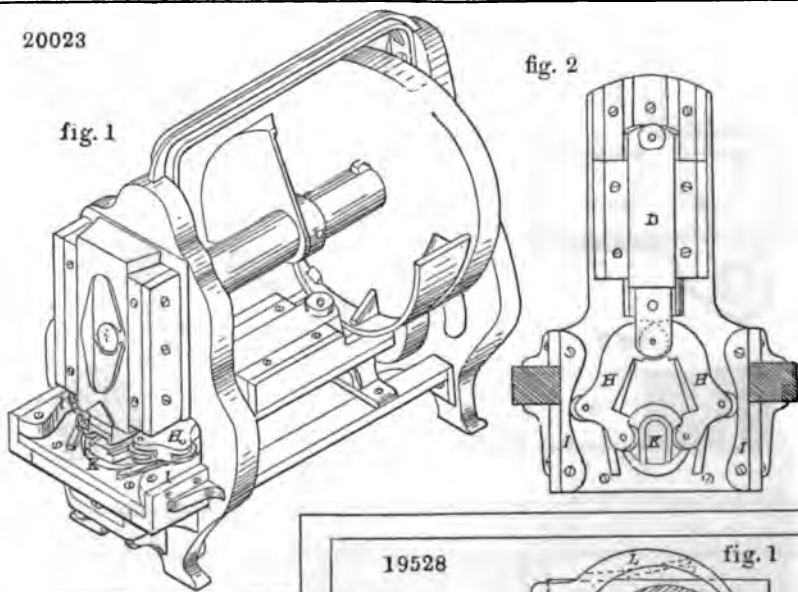


fig. 2

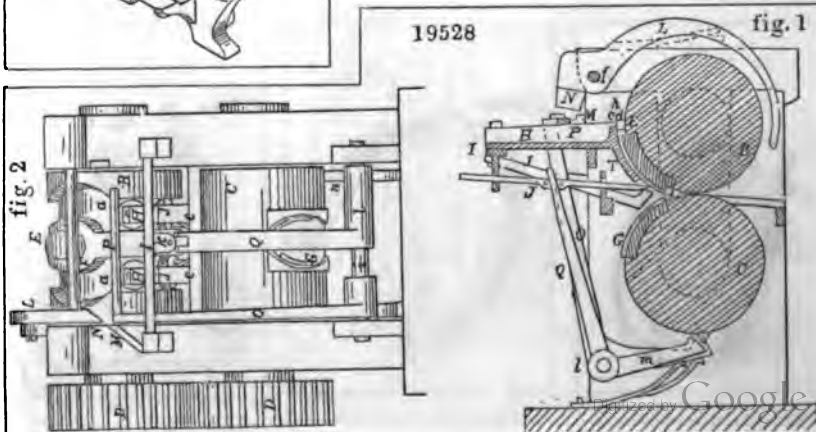




20023

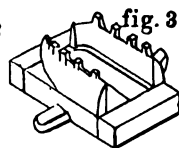
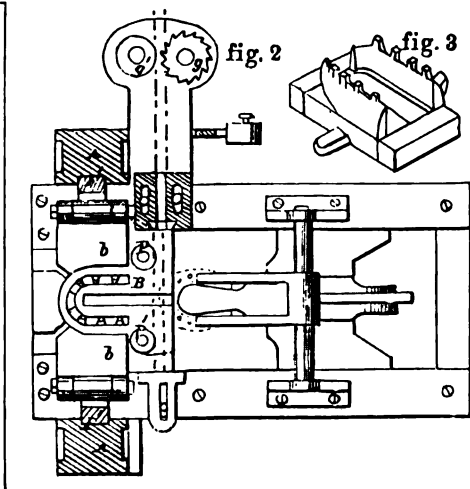
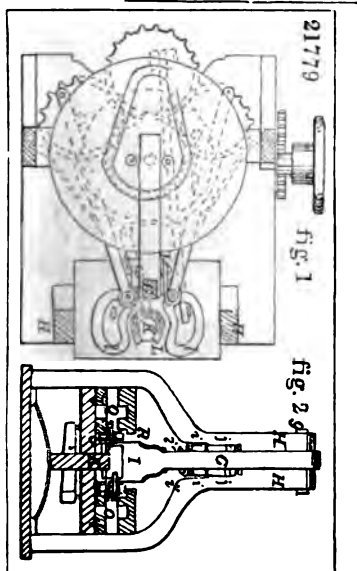
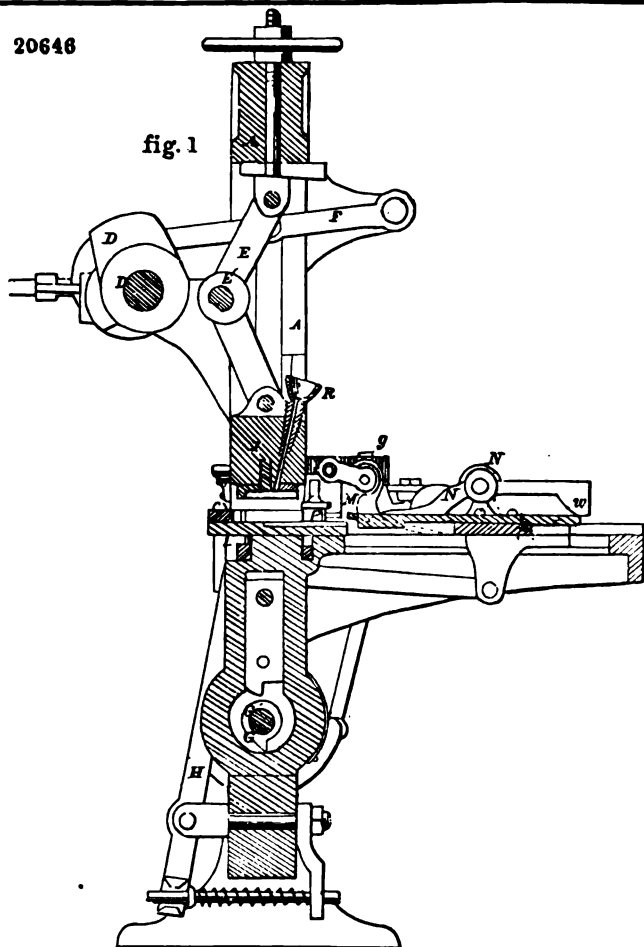


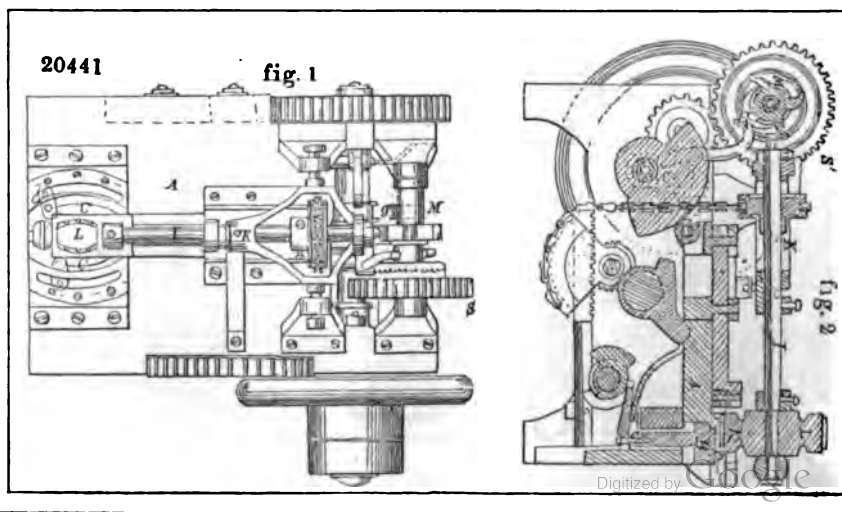
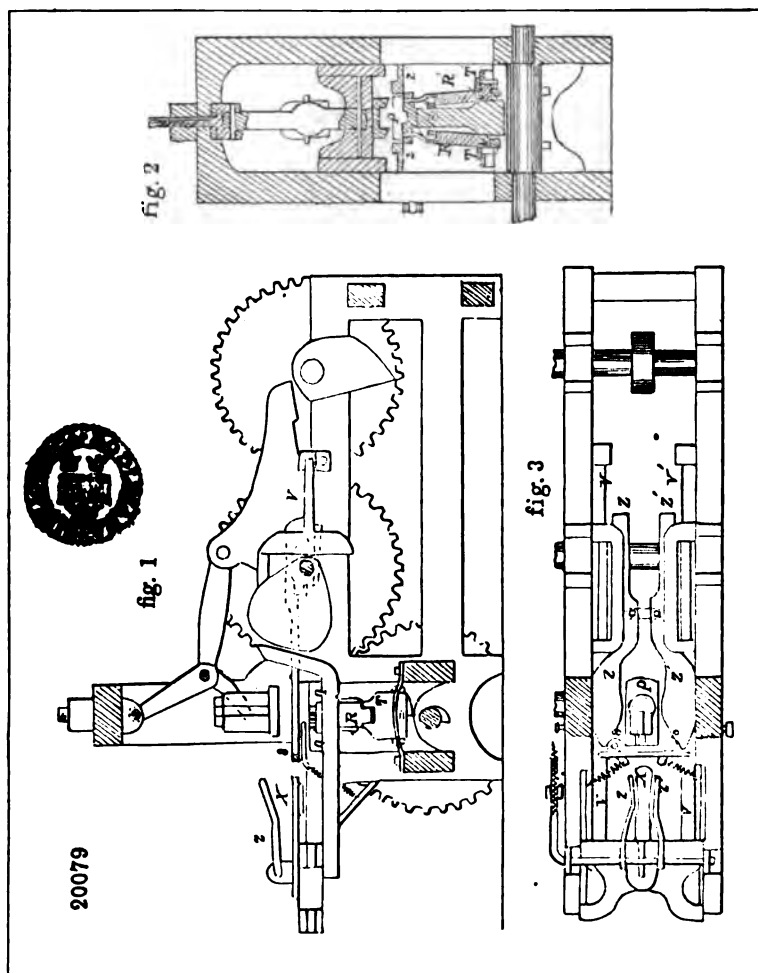
19528

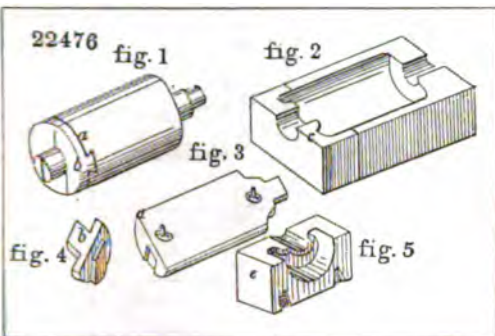


20646

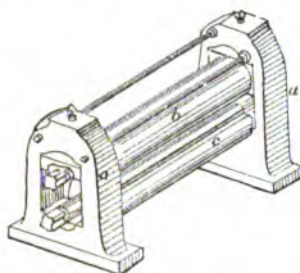
fig. 1



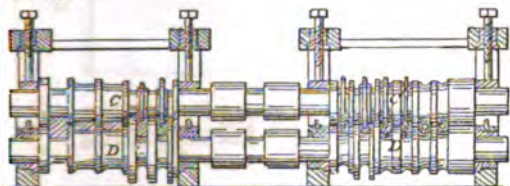




21844



19799



20009



19641

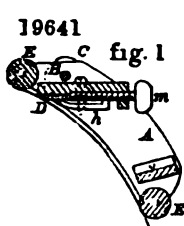
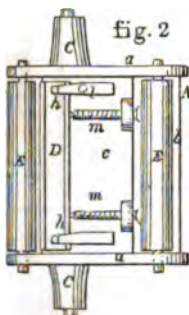


fig. 2



20280

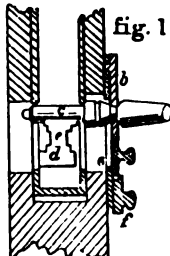
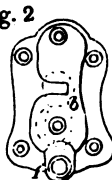
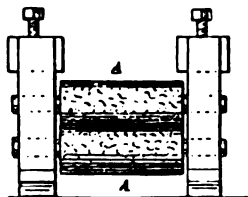


fig. 2



21692



21616



21817

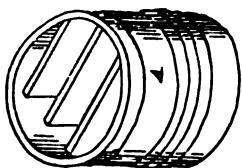


fig. 1

19017



fig. 3

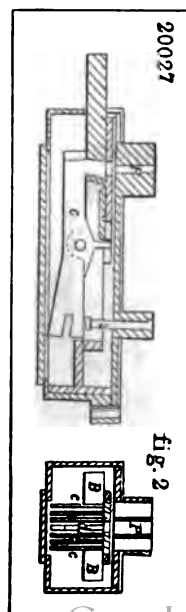
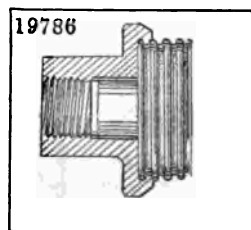
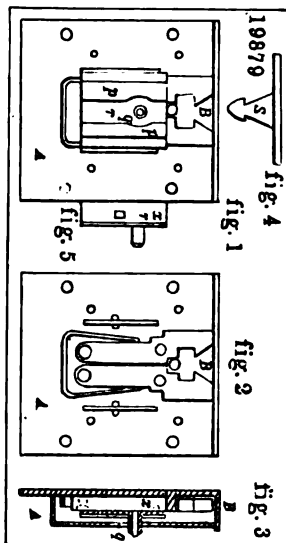
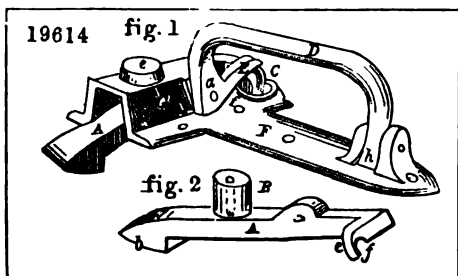
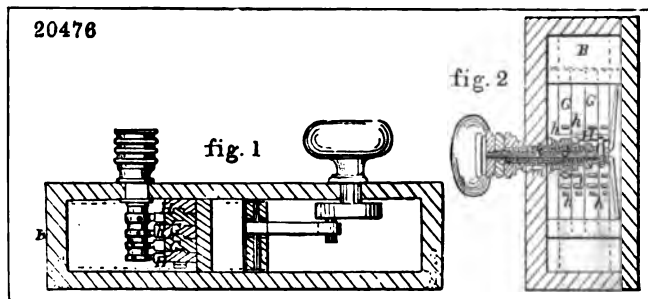
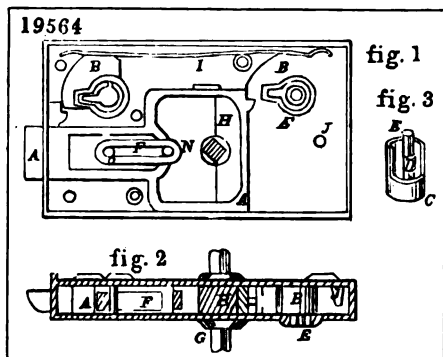
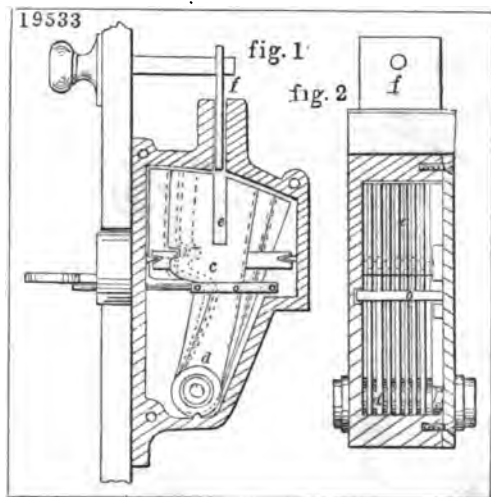


fig. 4

fig. 2







21994

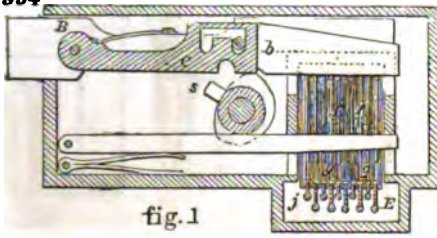
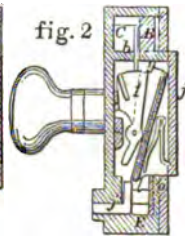


fig. 1

fig. 2



20850

fig. 1

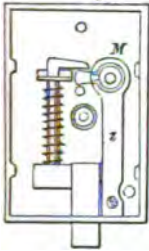
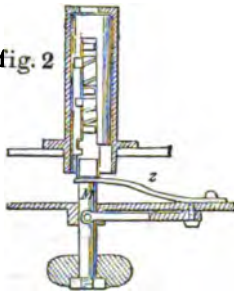


fig. 2



21293

fig. 1

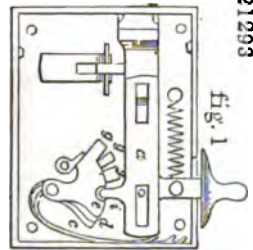
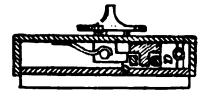


fig. 2



21346

fig. 1

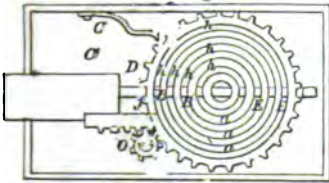


fig. 2

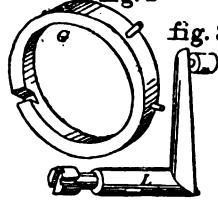
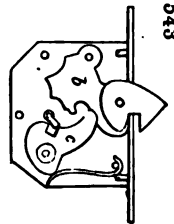


fig. 3



21543

21636

fig. 1

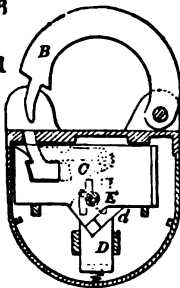
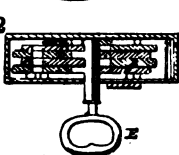


fig. 2



21103

fig. 1

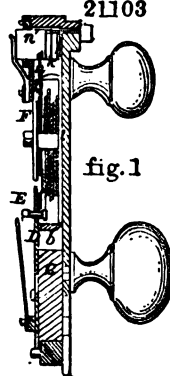
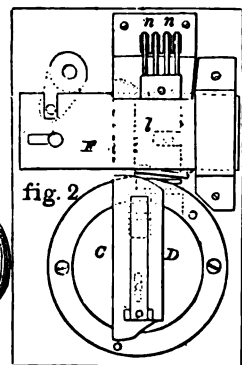


fig. 2



21689

fig. 1

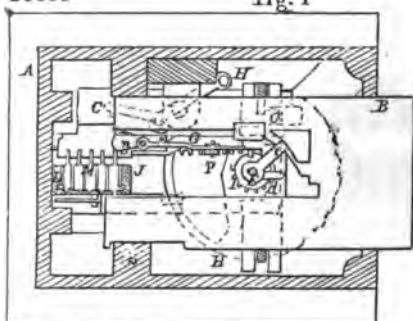
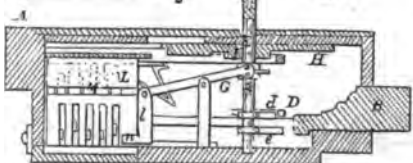


fig. 3



fig. 2



21962

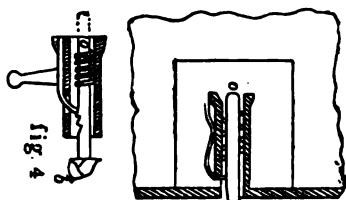


fig. 1



fig. 2

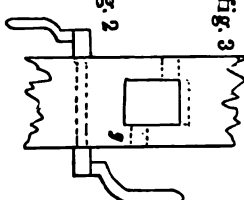


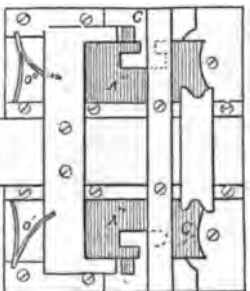
fig. 3

22046

fig. 1



fig. 2



22425

fig. 1

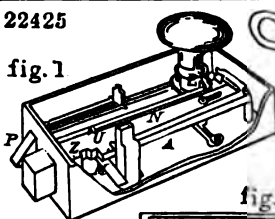


fig. 2

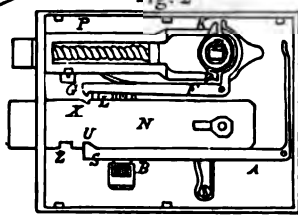
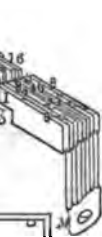


fig. 3



22146

fig. 1

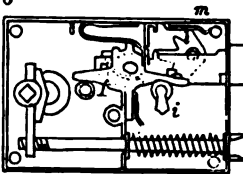
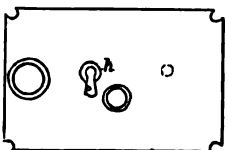


fig. 2



22319

fig. 1

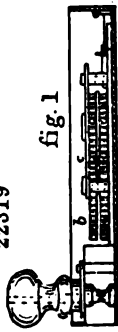
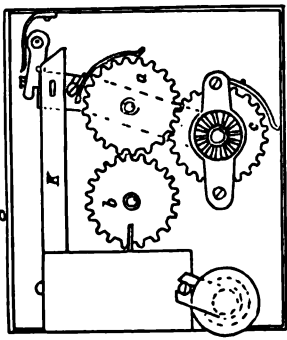


fig. 2



21947

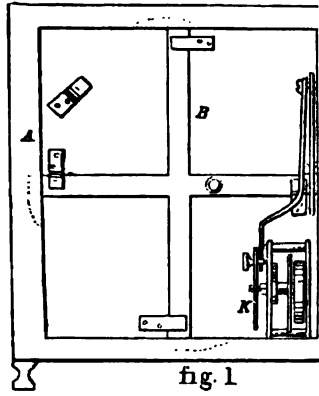


fig. 1

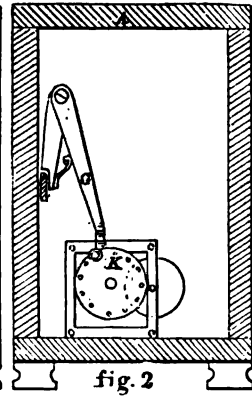
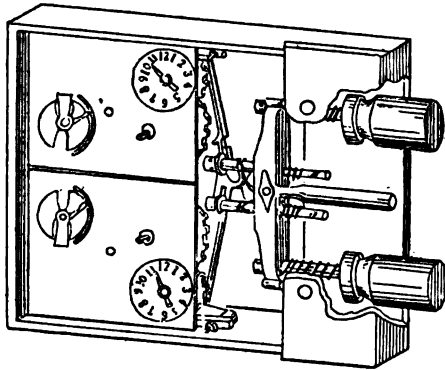


fig. 2

19927



21862

fig. 1

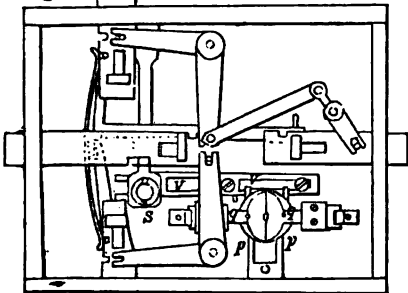


fig. 3



fig. 2

20716

fig. 1

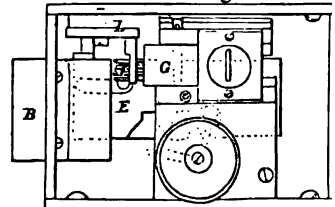
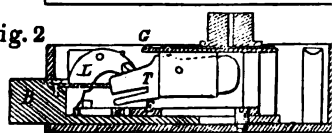
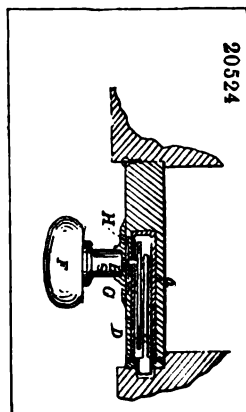
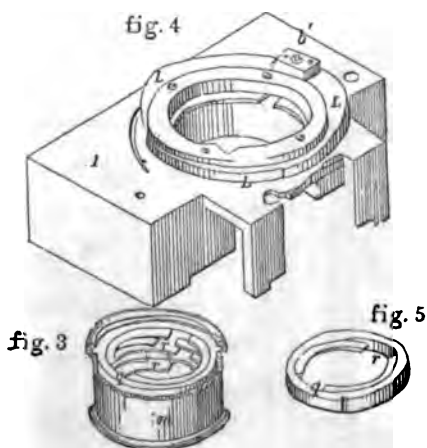
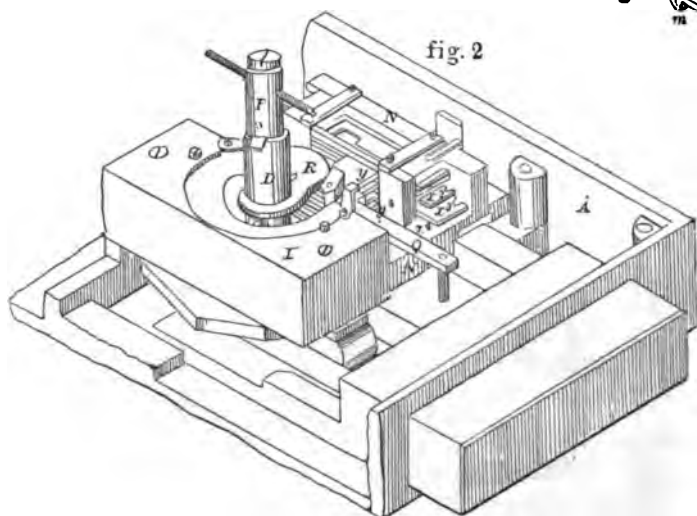
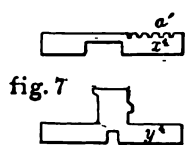
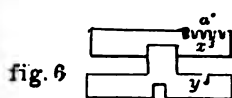
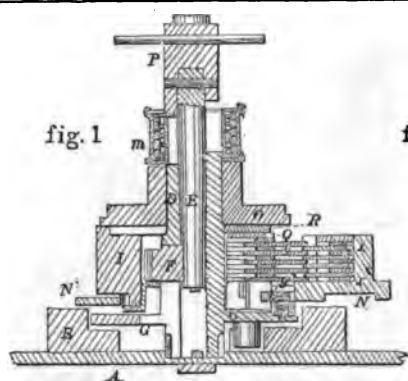


fig. 2



20658



19208

fig. 1

**fig. 2**

fig. 3

fig. 4

fig. 1

19815

22000

20063

fig. 1

**fig. 2**

**20571**

fig. 1

**fig. 2**

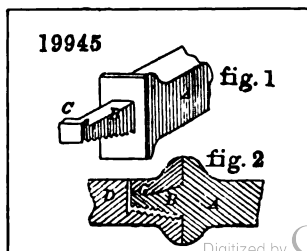
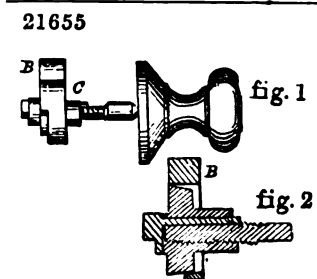
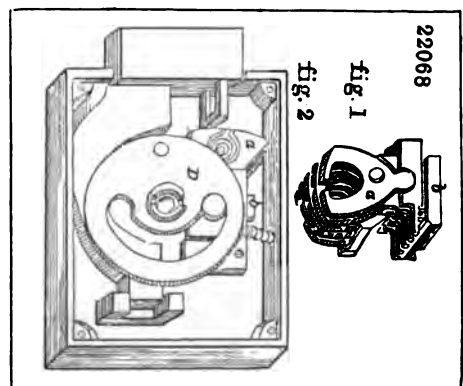
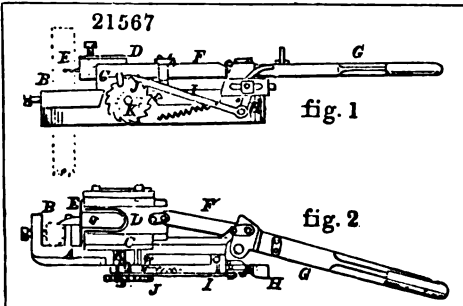
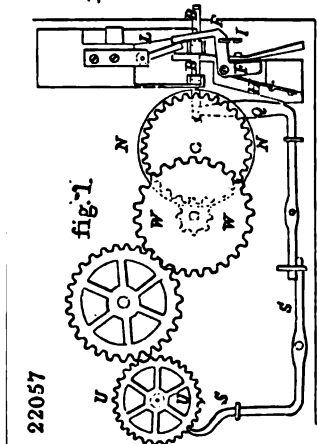
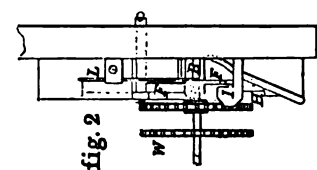
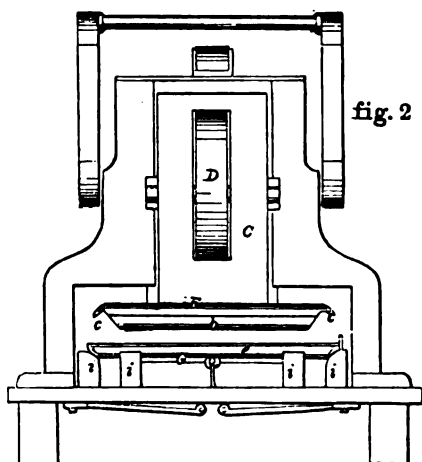
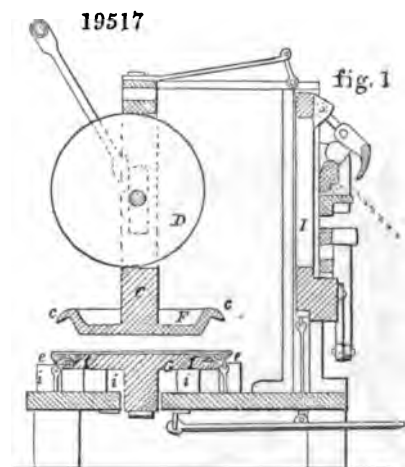
**21504**

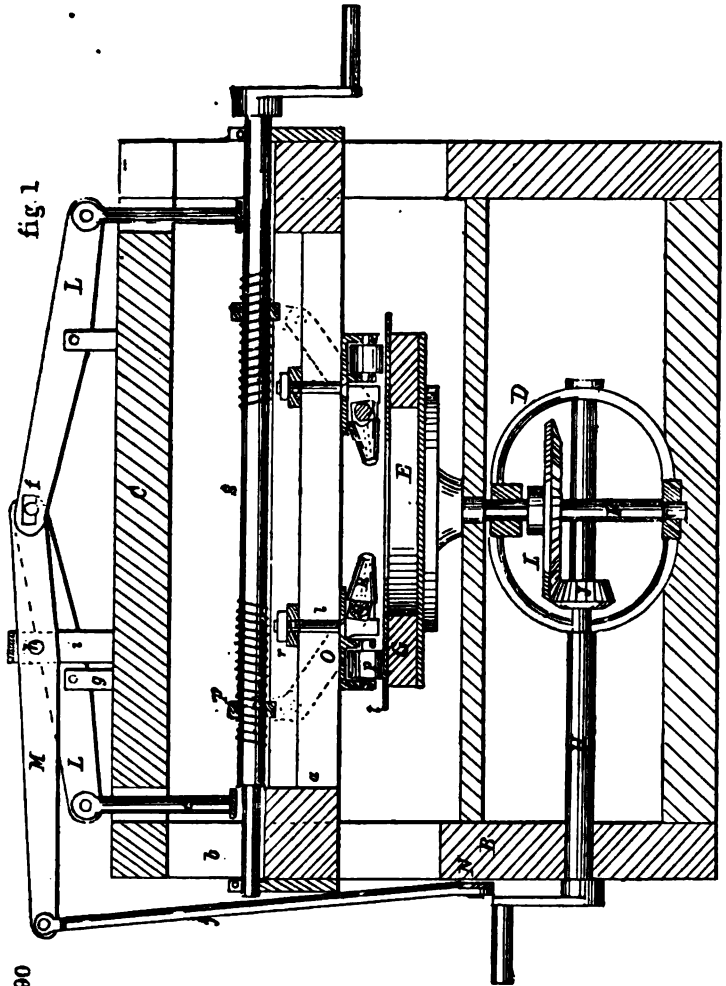
**.fig. 1**

**fig. 2**

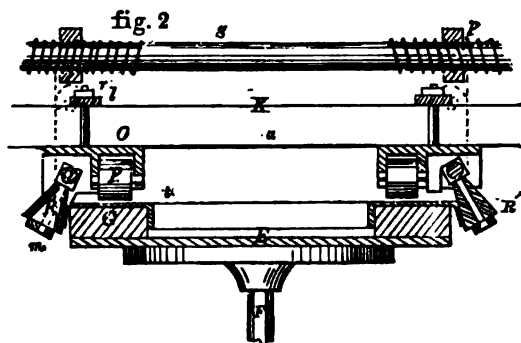
**fig. 3**

19529



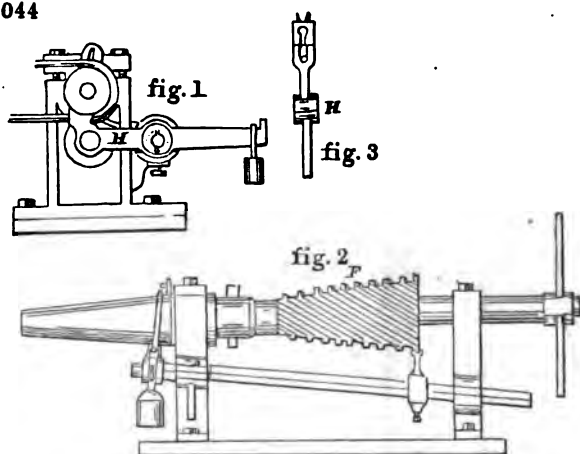


19090

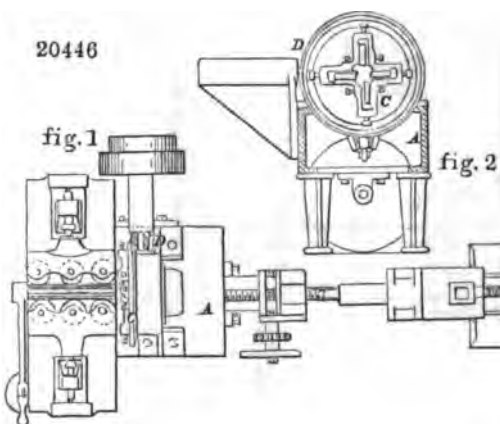




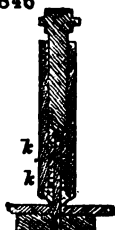
22044



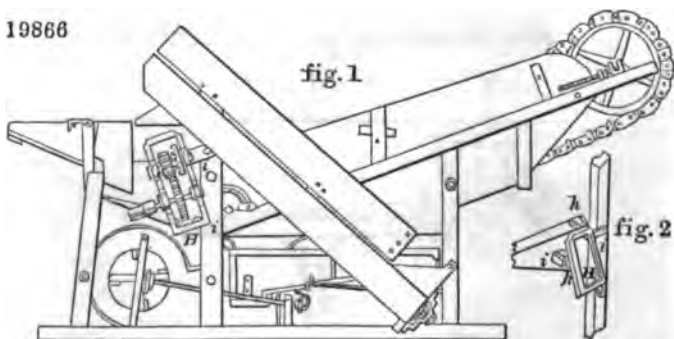
20446

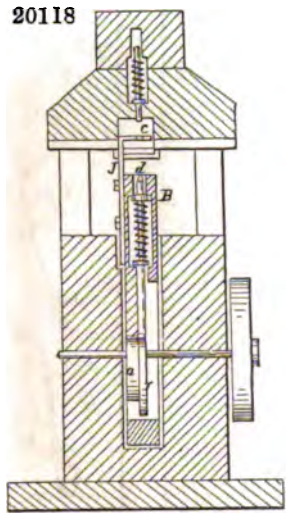
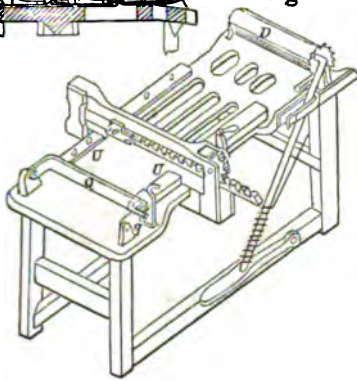
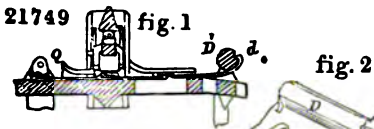


20846

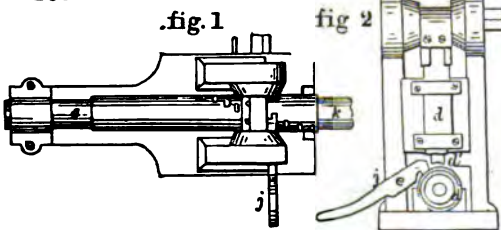


19866

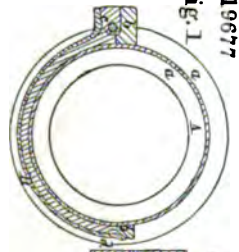




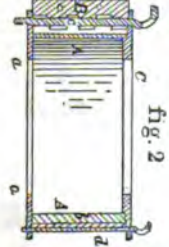
20165



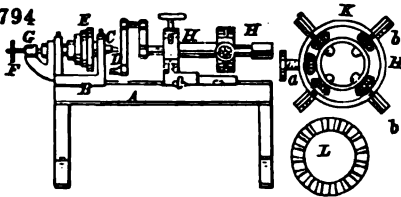
19677  
**fig. 1**



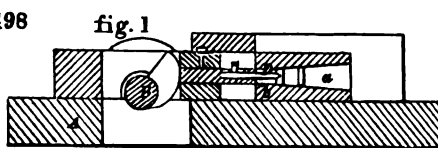
**fig. 2**



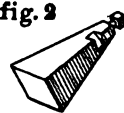
20794



19498



**fig. 2**





20829

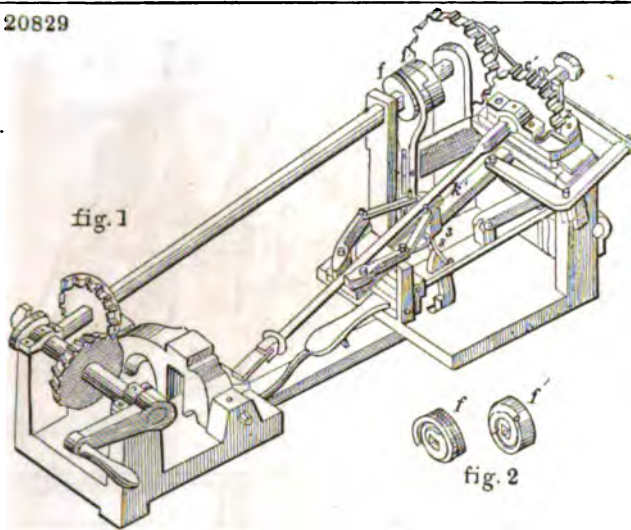


fig. 1

19631

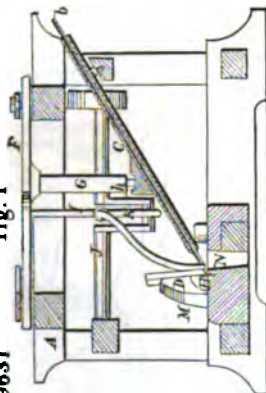
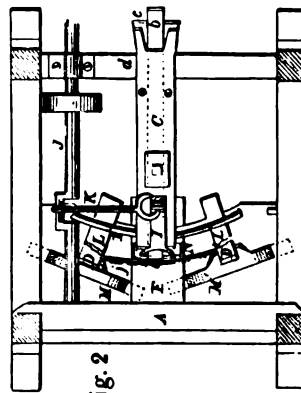
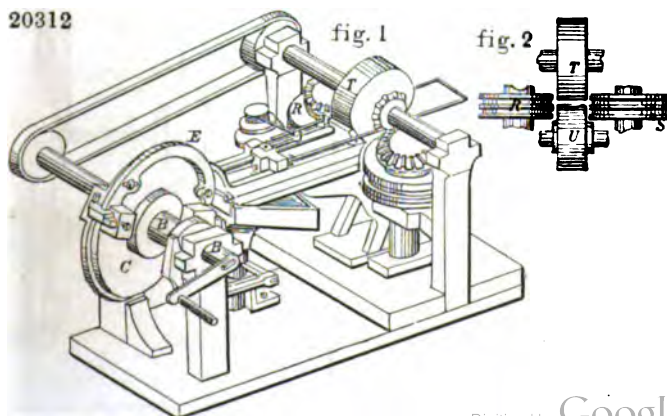


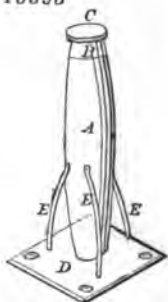
fig. 2



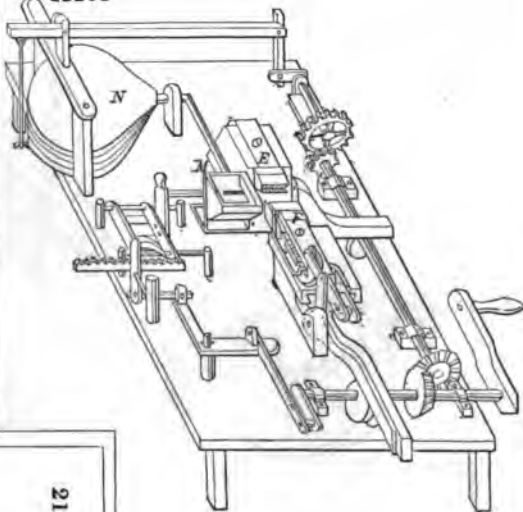
20312



19993



22238



21222

fig. 1

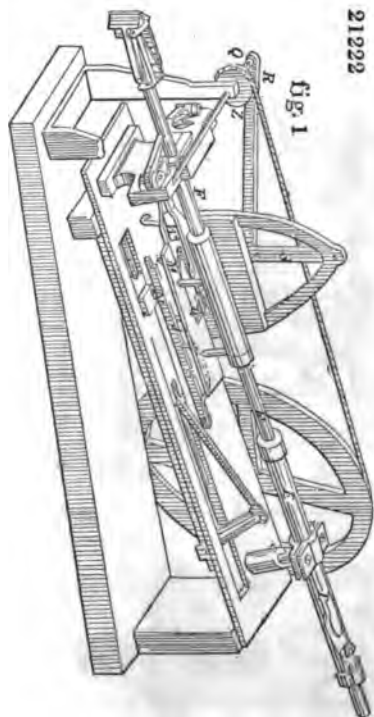
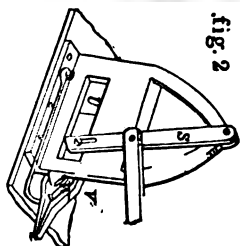


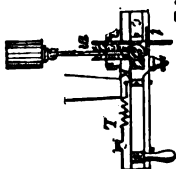
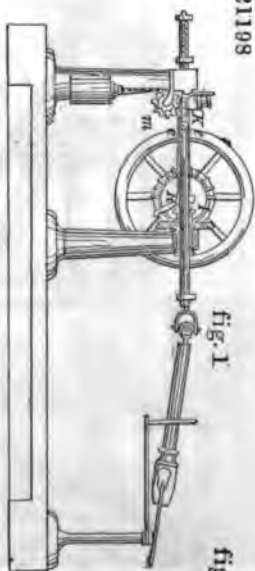
fig. 2

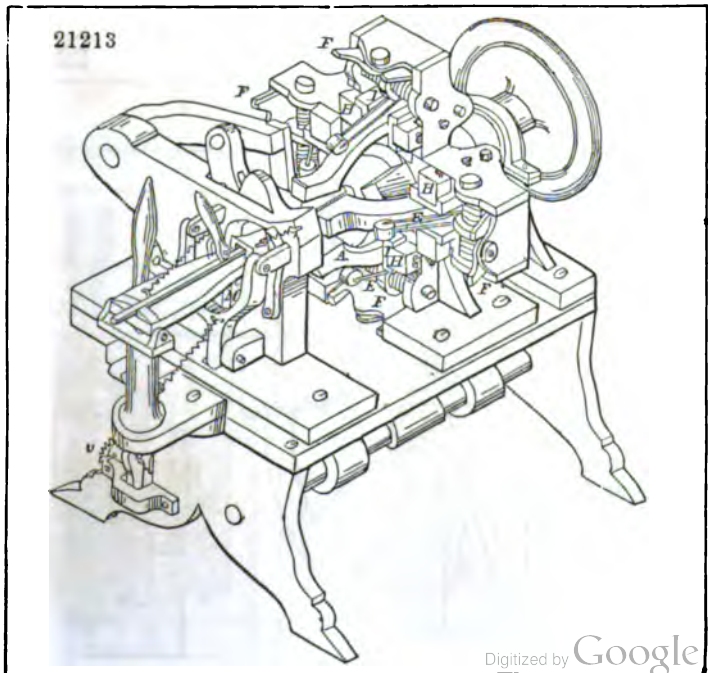
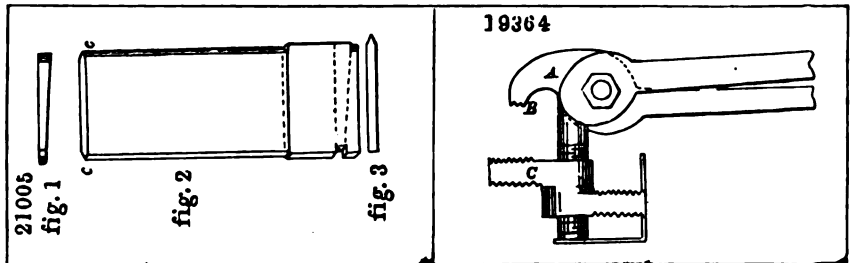
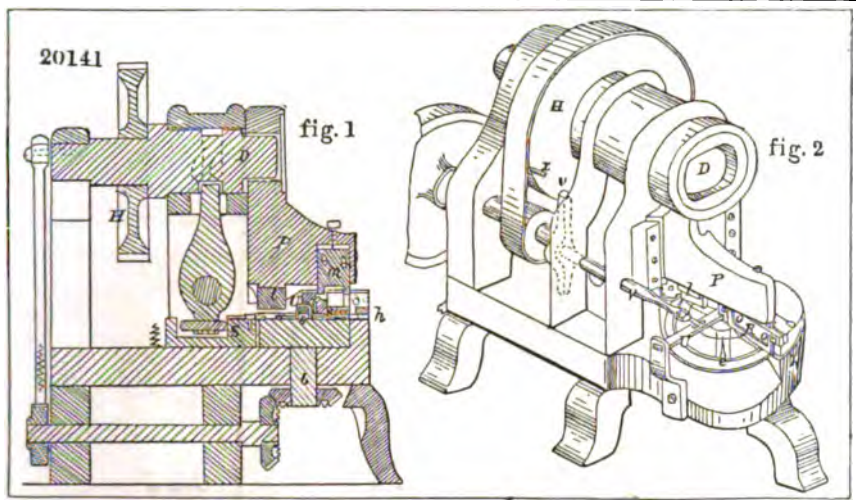


21198

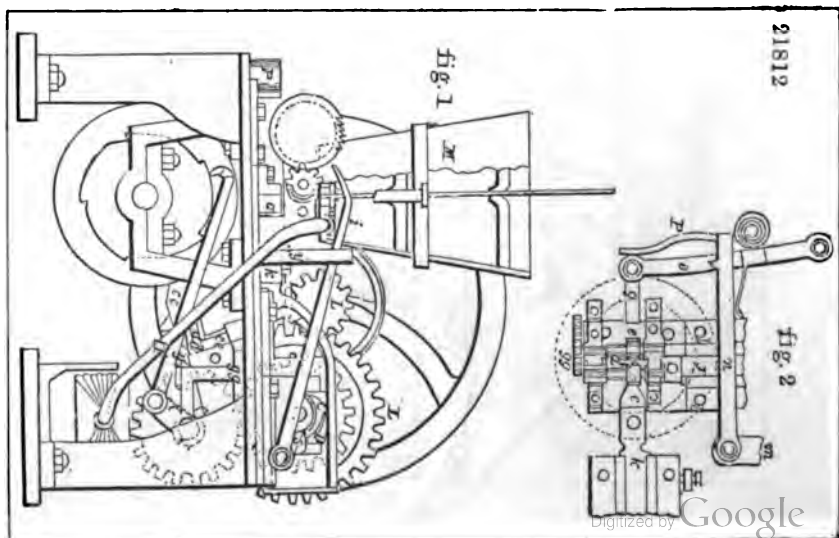
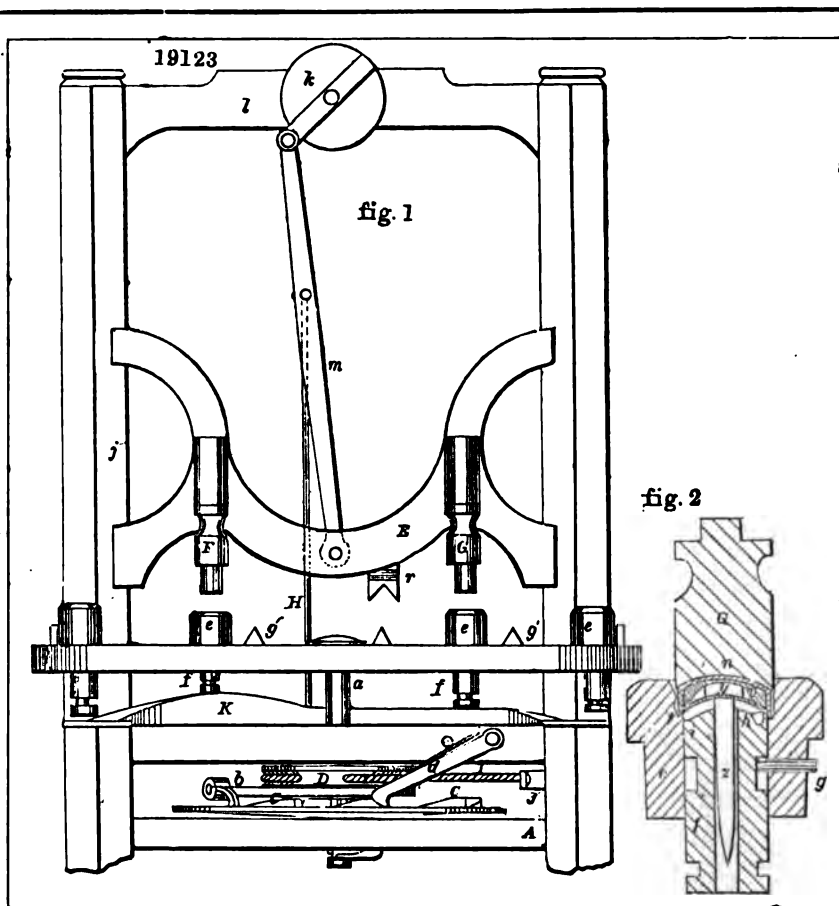
fig. 1

fig. 2









21551

fig. 1

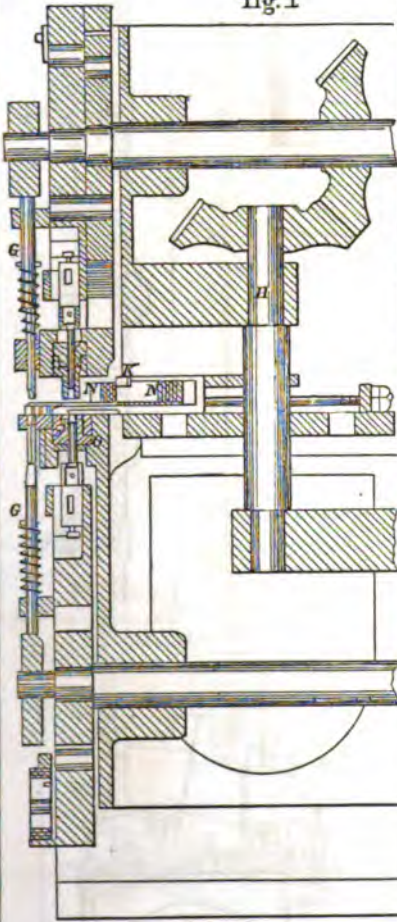
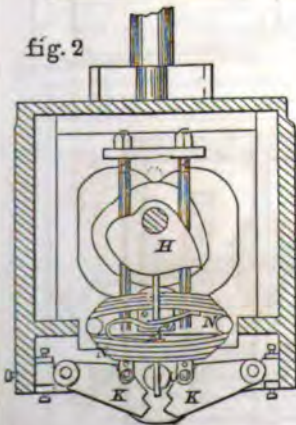


fig. 2



20145

fig. 1

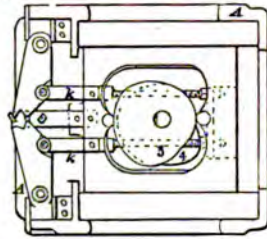
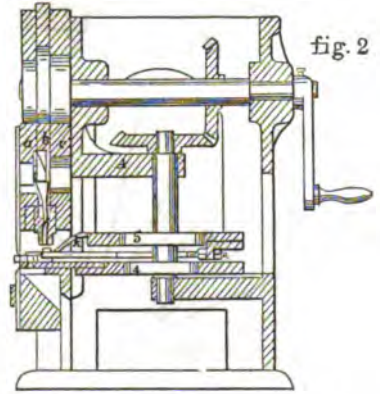
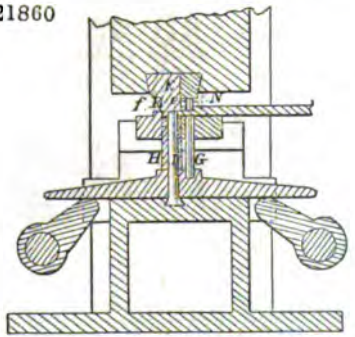


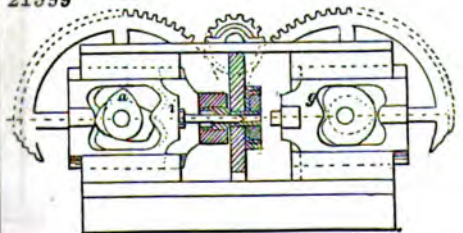
fig. 2



21860



21599





20686

fig. 1

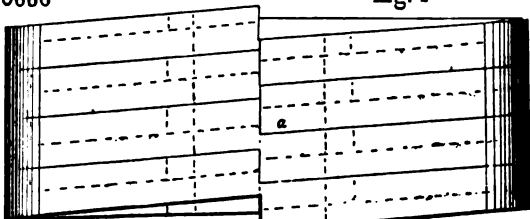
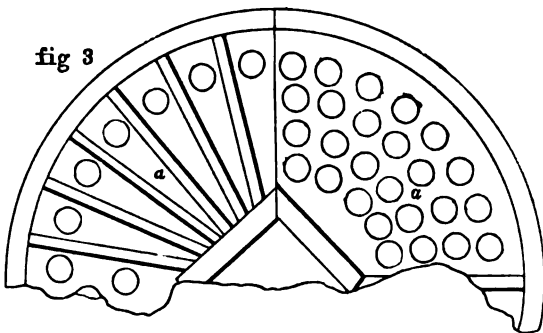


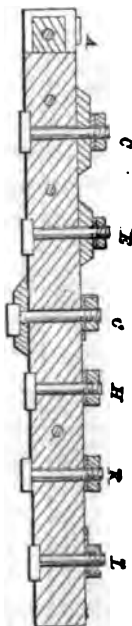
fig. 2



fig 3



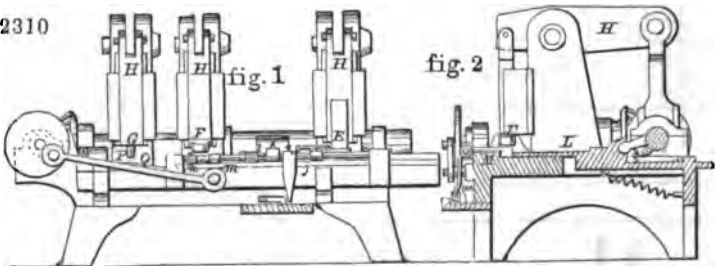
21574



22310

fig. 1

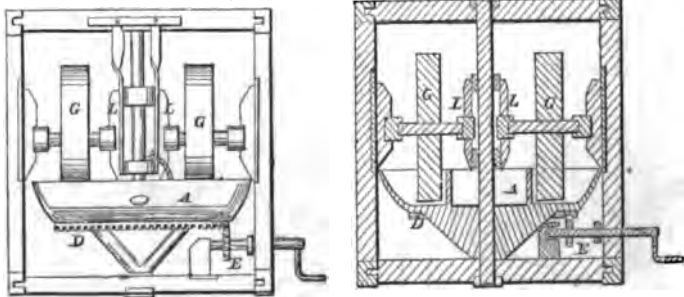
fig. 2

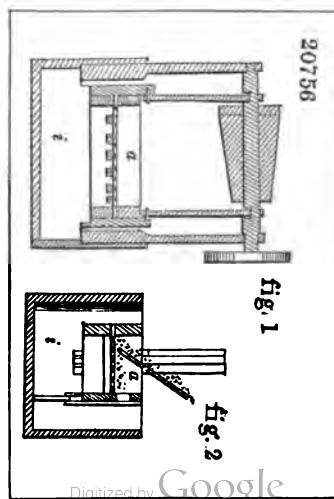
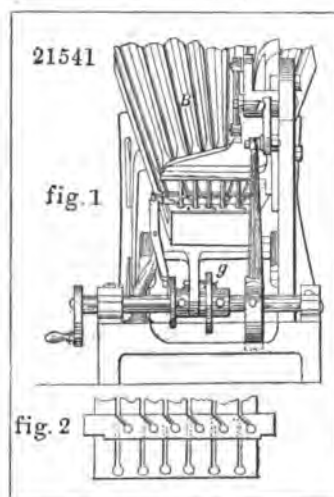
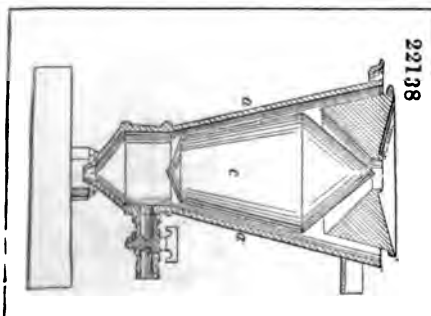
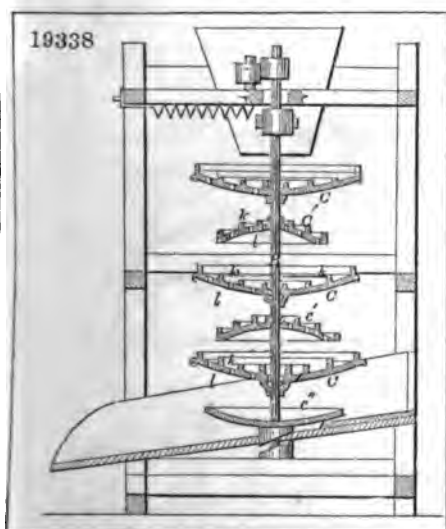
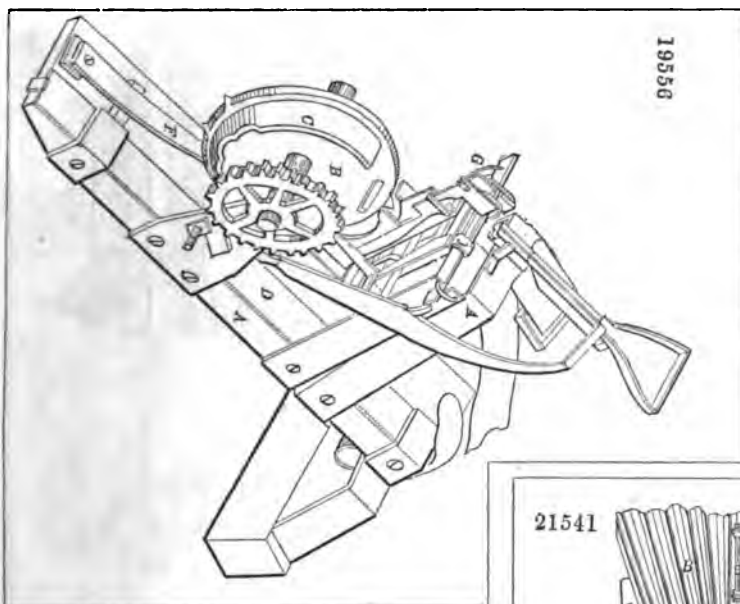


19670

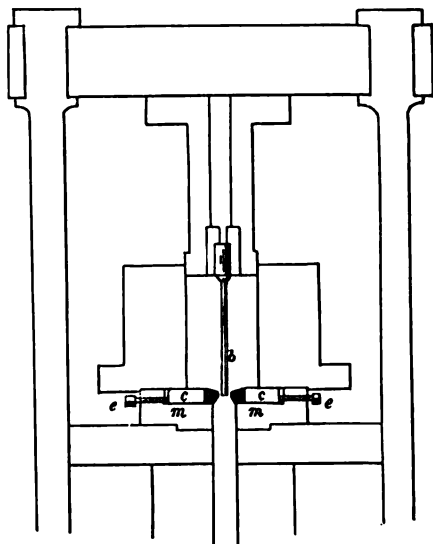
fig. 1

fig. 2





19313



20171

fig. 1

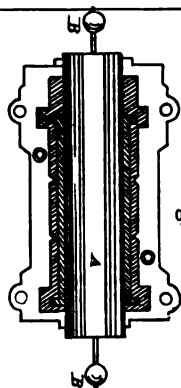
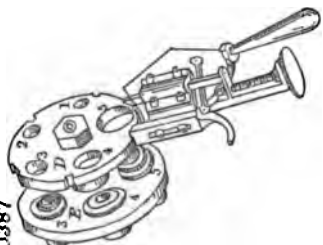


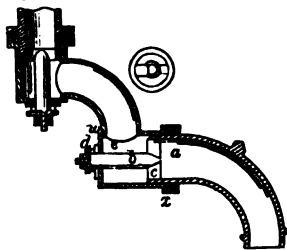
fig. 2



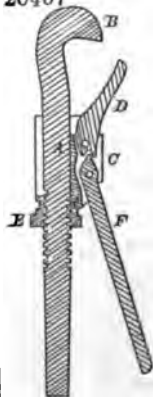
20387



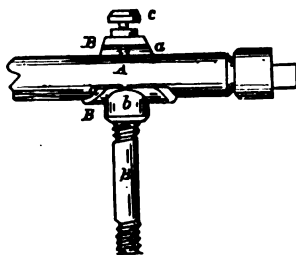
20717



20407



19852



19944

fig. 1

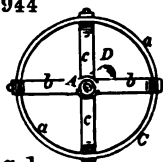
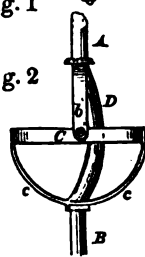
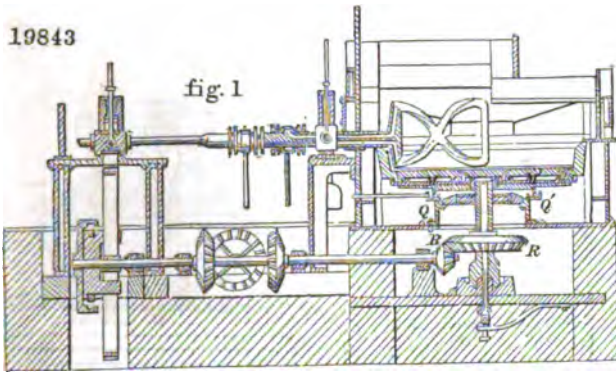


fig. 2



19843



X' fig. 2



fig. 3



20743

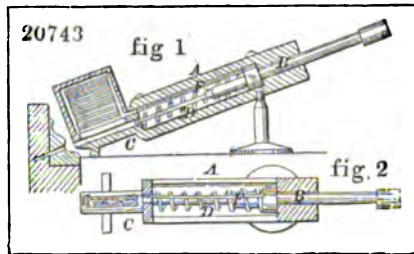
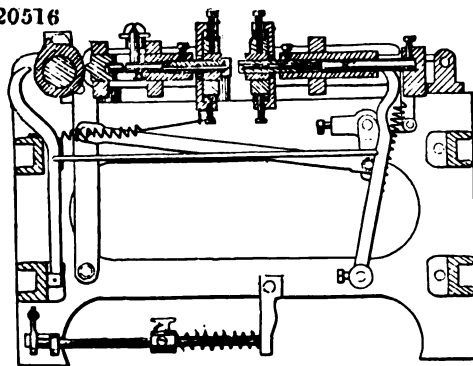


fig. 2



20516



20460

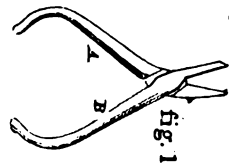


fig. 1

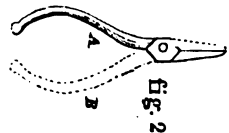
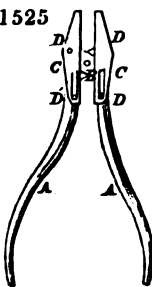


fig. 2

21525



22157

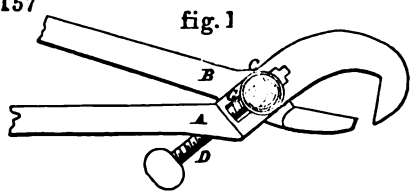
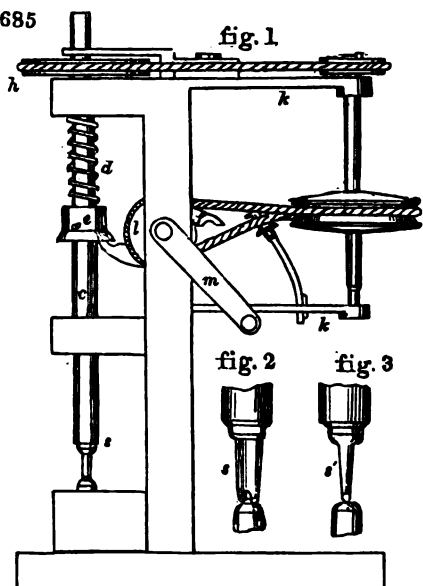


fig. 1

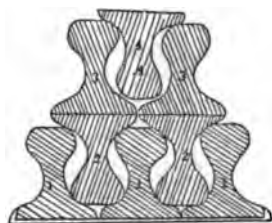
fig. 2



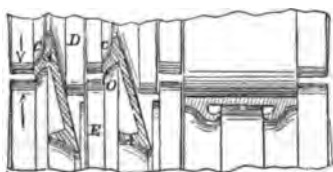
20685



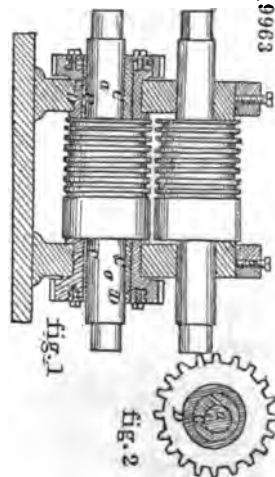
20702



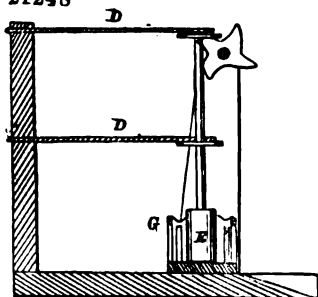
20901



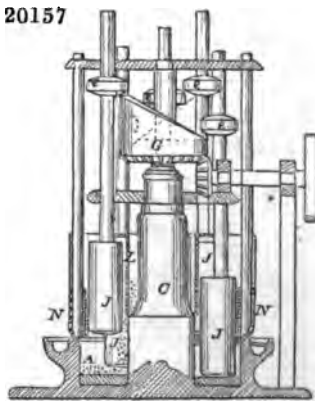
19963



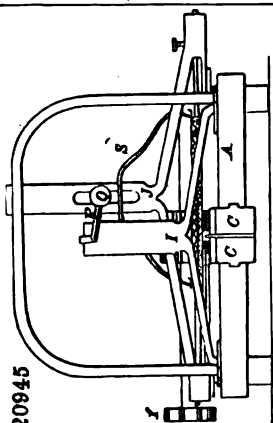
21248



20157



20945



20736

fig. 1

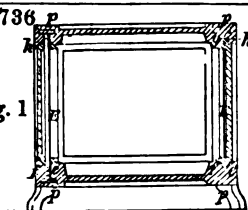
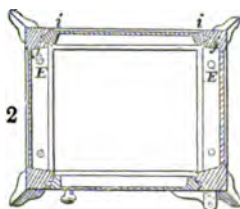
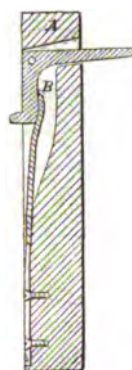


fig. 2



20544



21666

fig. 1

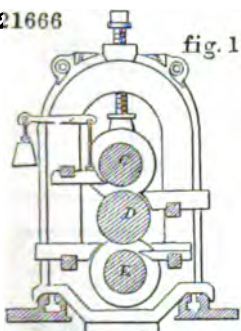
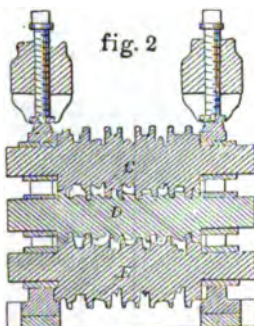
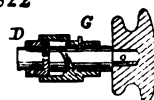


fig. 2



20822



21427

fig. 1

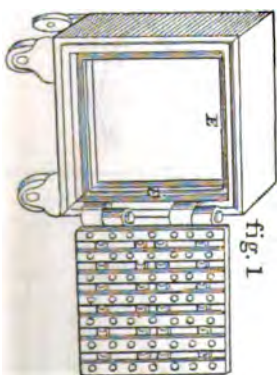
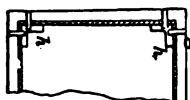


fig. 2



21483

fig. 1

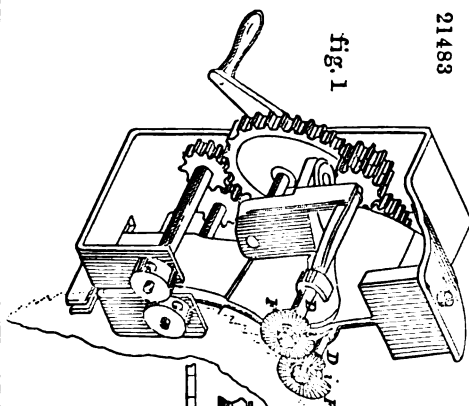
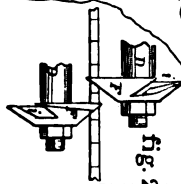


fig. 2



22260

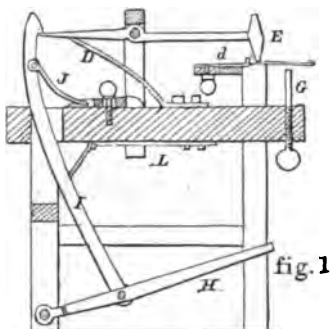


fig. 1

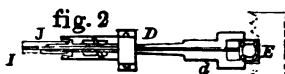


fig. 2

19835

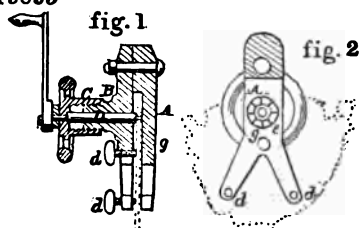


fig. 1

fig. 2

21729

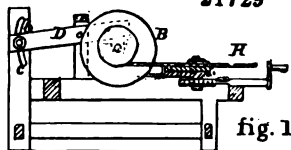


fig. 1

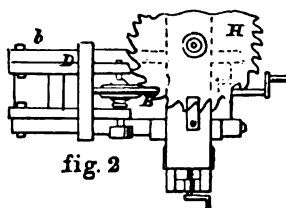


fig. 2

fig. 2

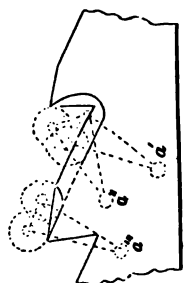
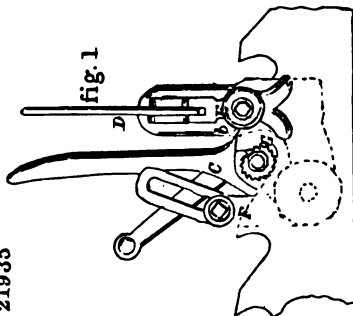


fig. 1



21935

22256

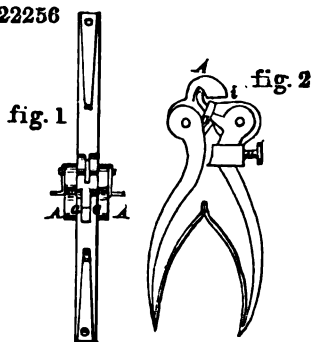
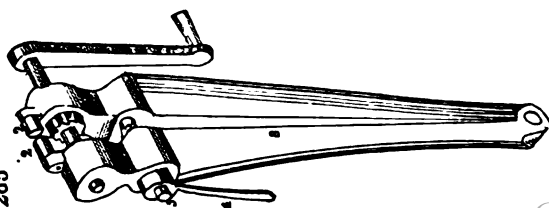


fig. 1

fig. 2

19265



19244

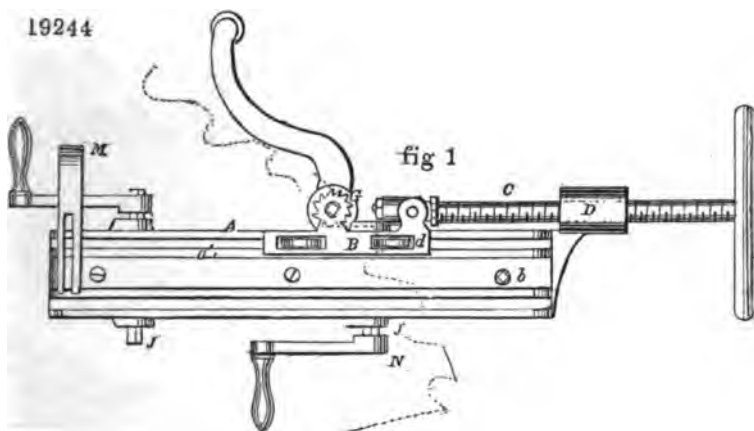
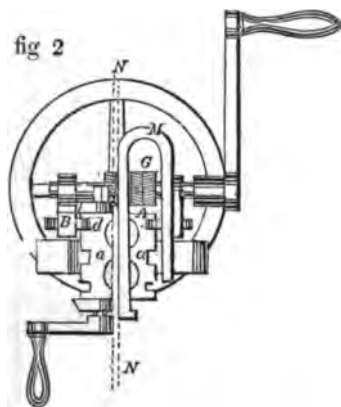


fig 2



20933

fig. 1

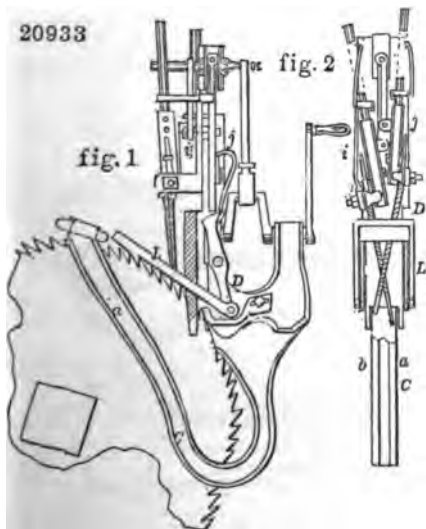
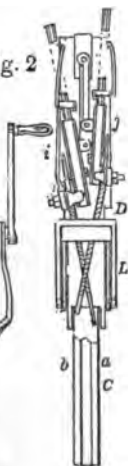


fig. 2



20330

fig. 1

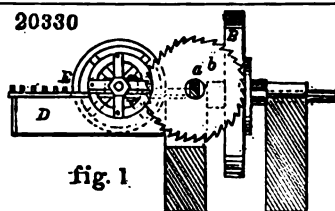
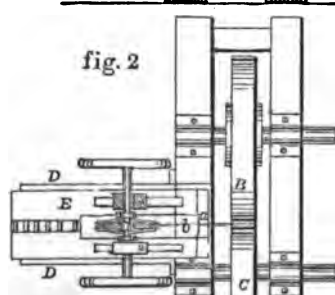
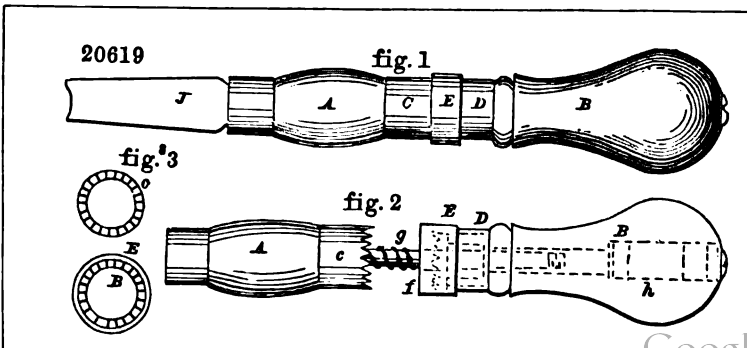
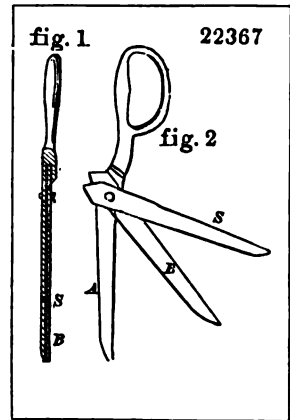
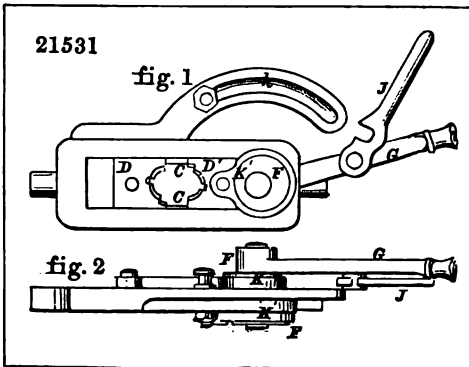
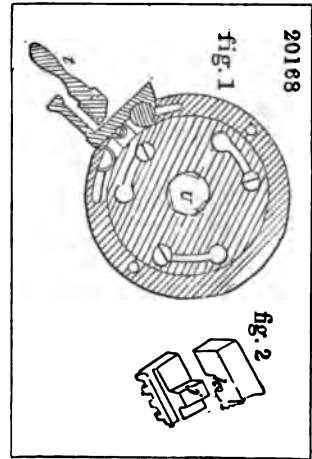
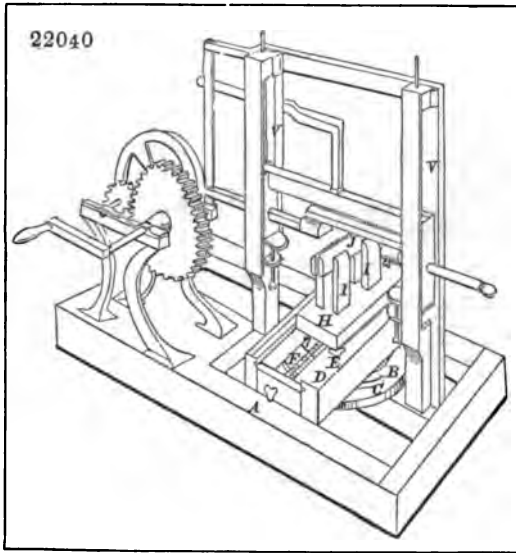
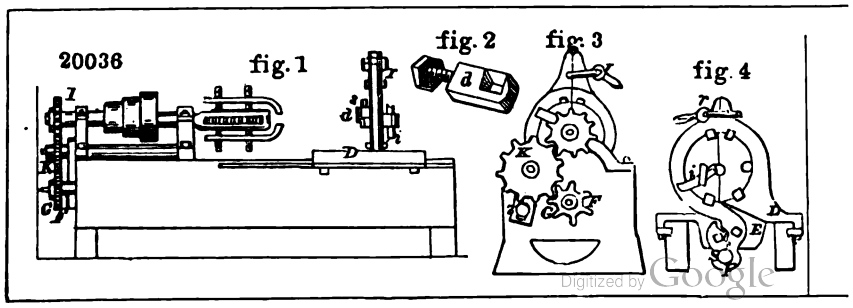
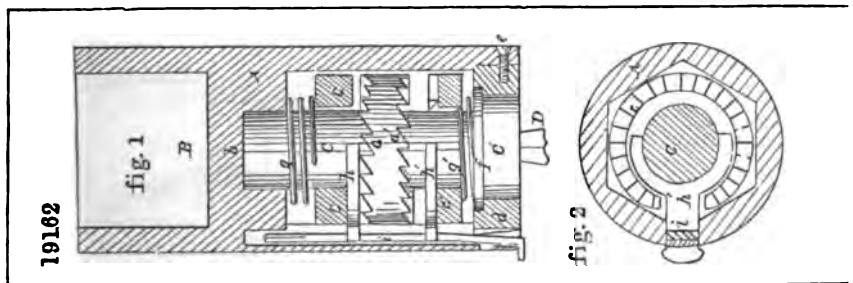
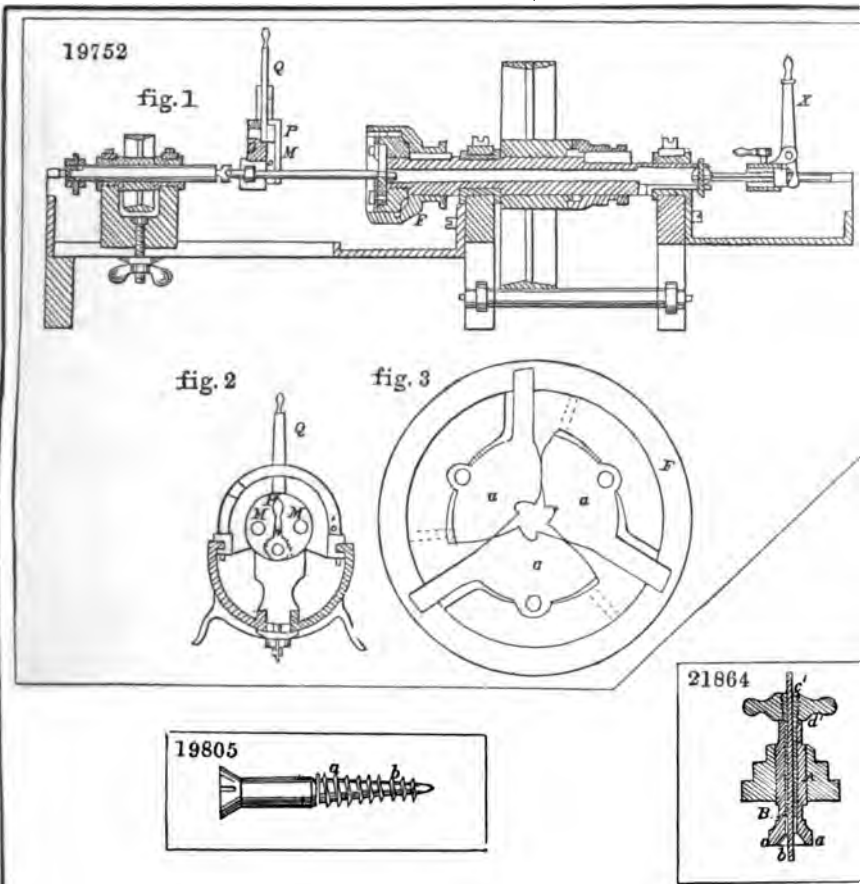


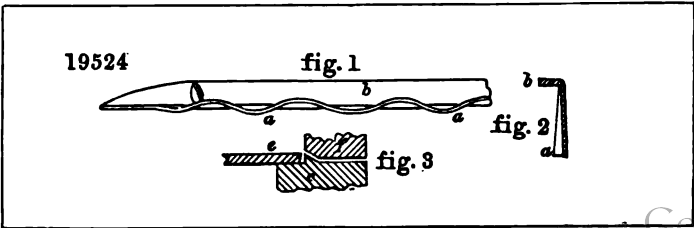
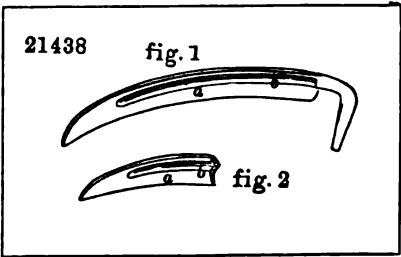
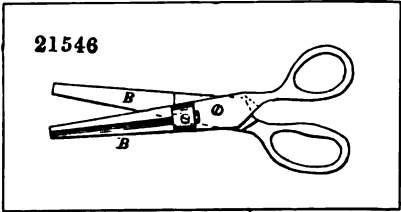
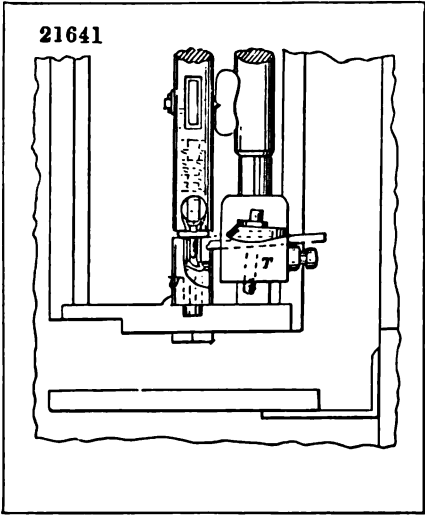
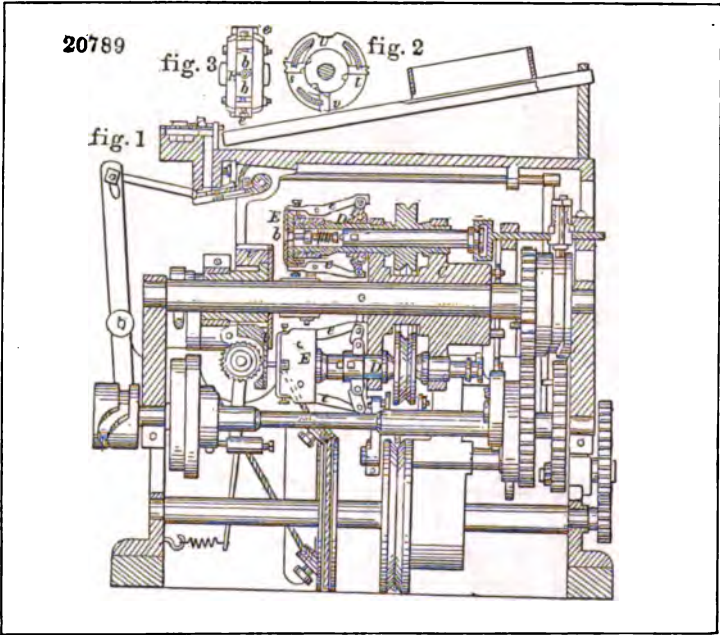
fig. 2











19152

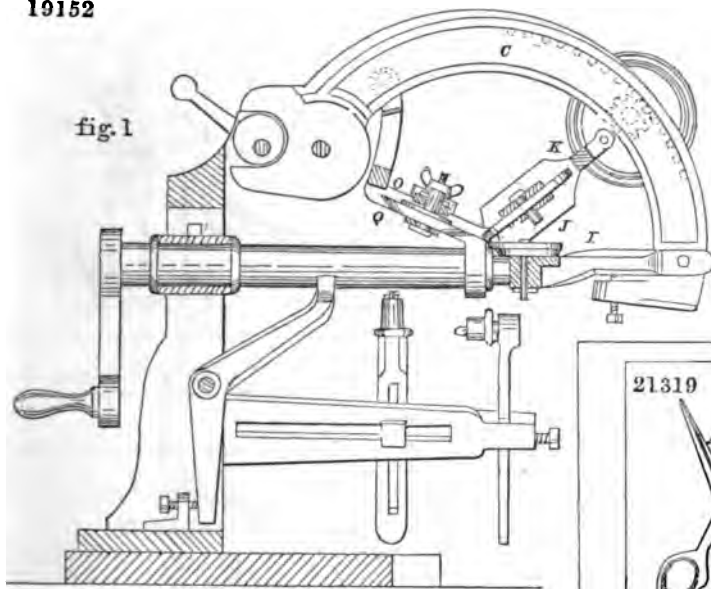
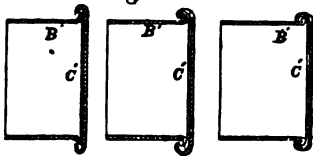


fig. 2



21319



22028

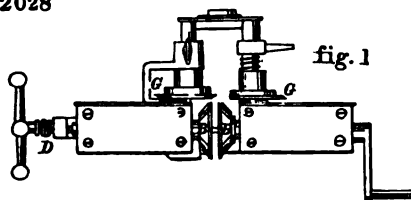
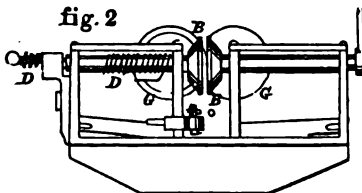


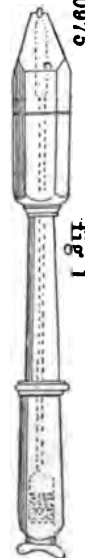
fig. 2

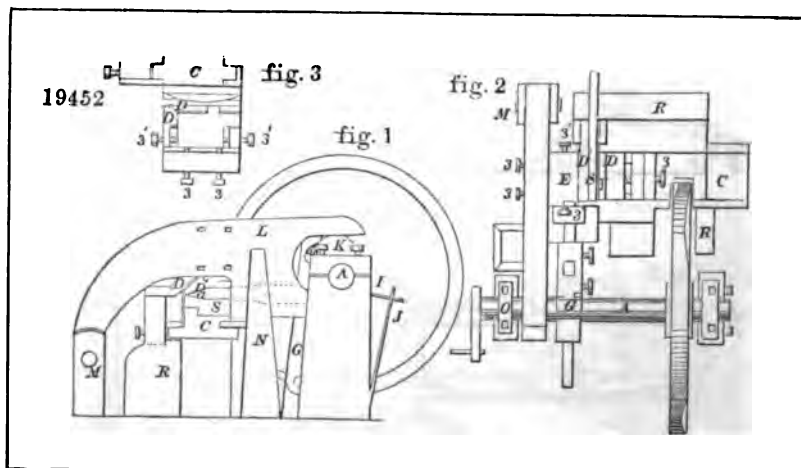
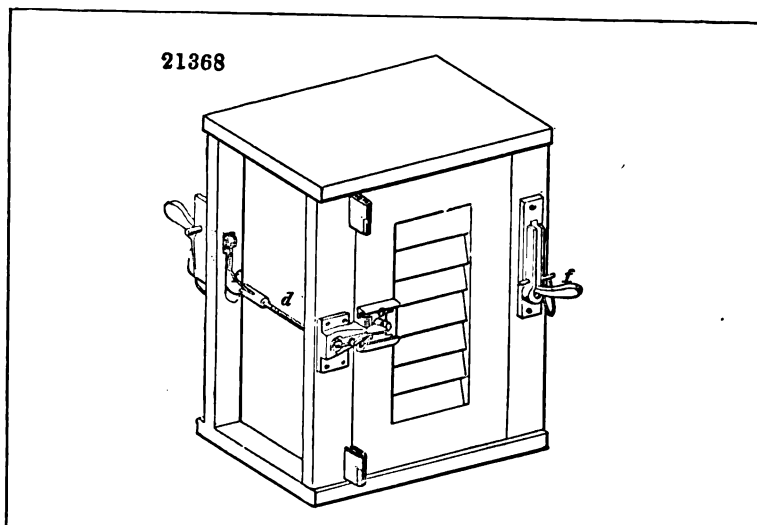
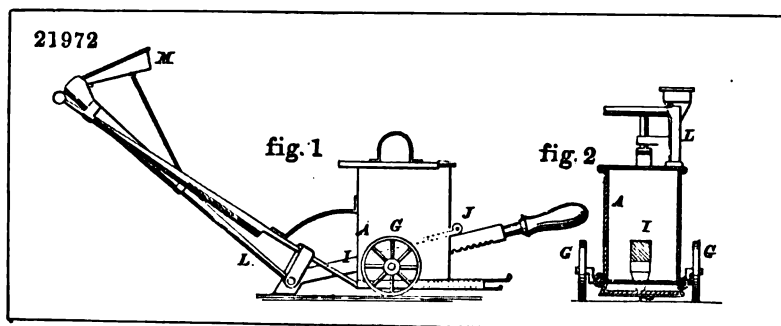


20975

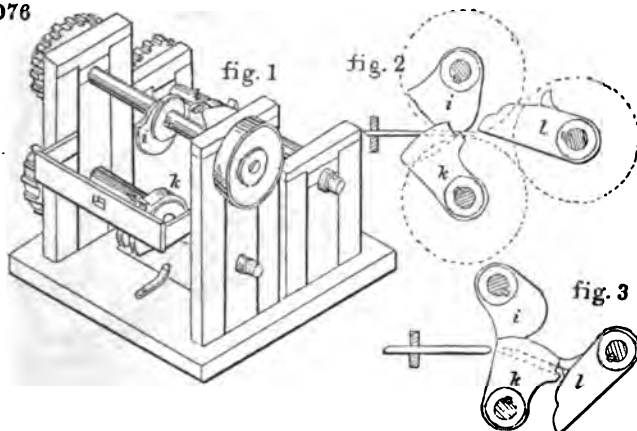


fig. 2

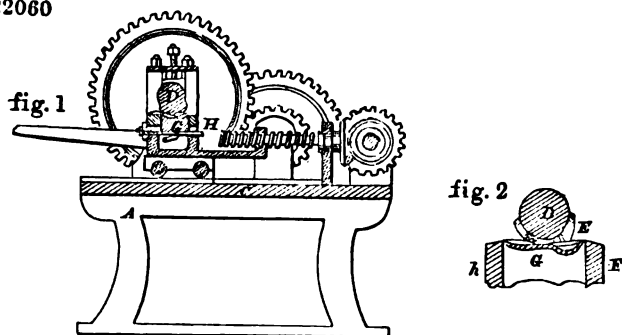




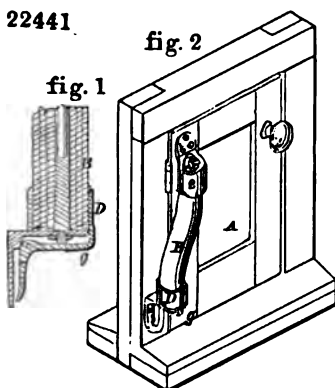
20076



22060



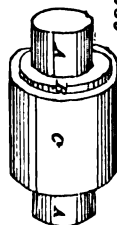
22441



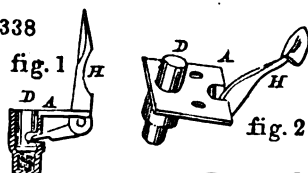
19747



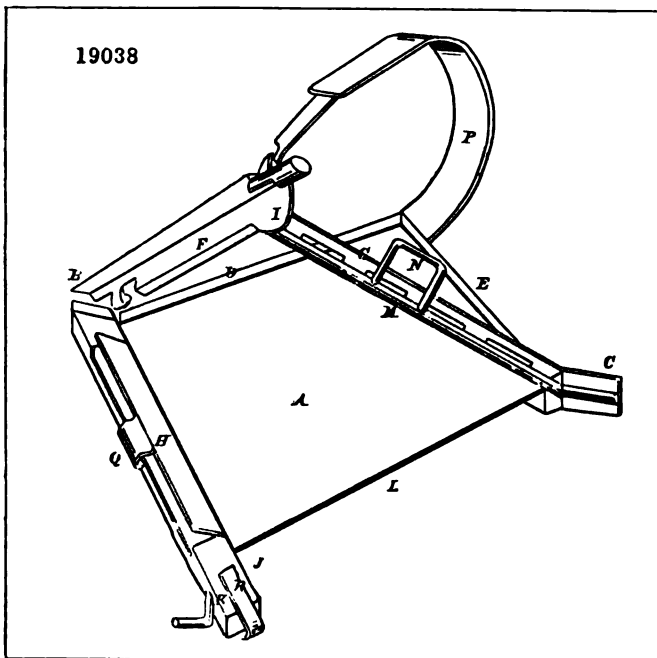
21039



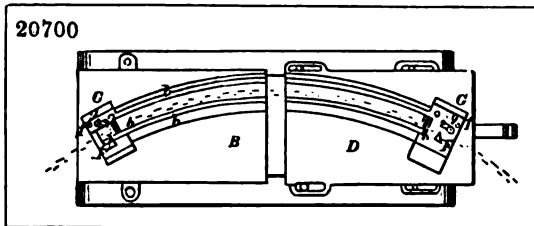
20338



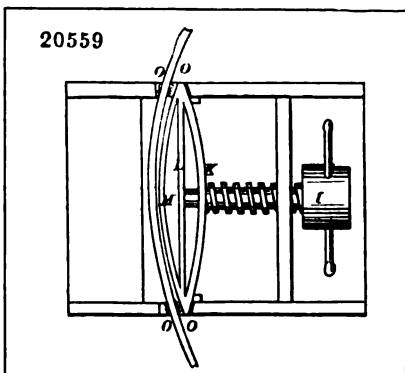
19038



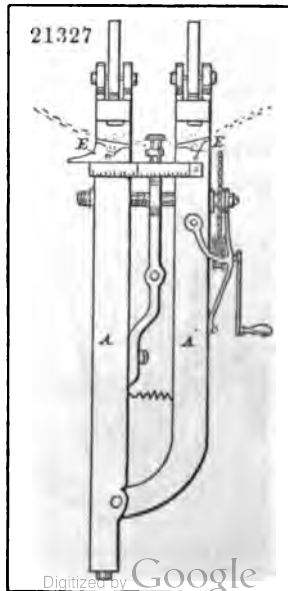
20700

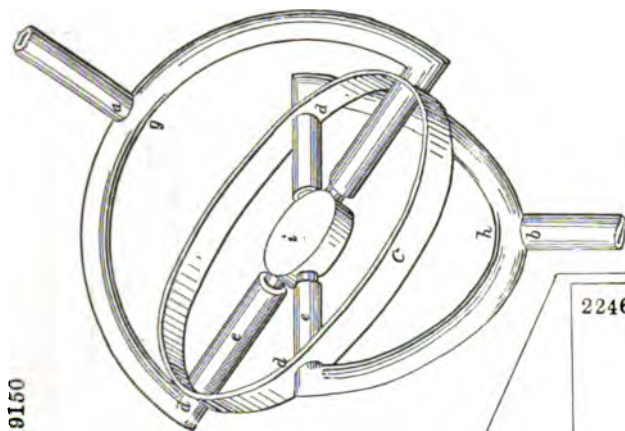


20559

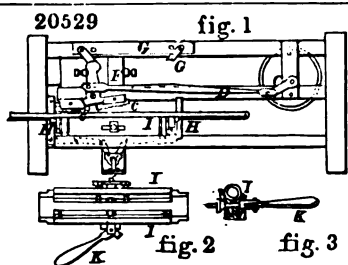
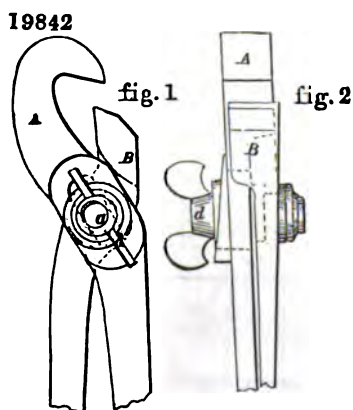
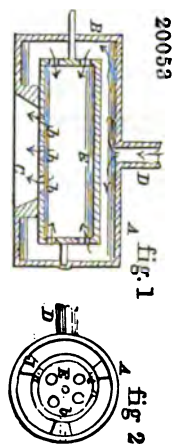
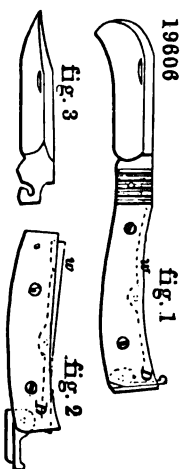
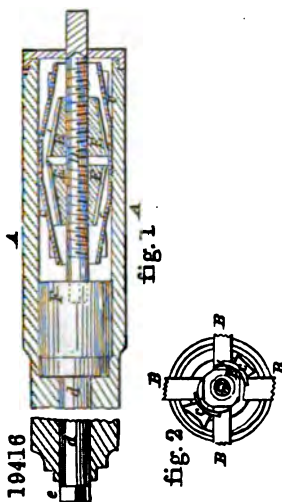
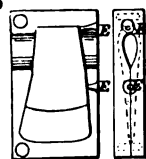


21327

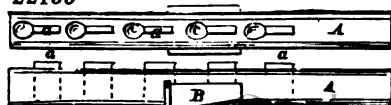




22466



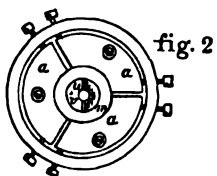
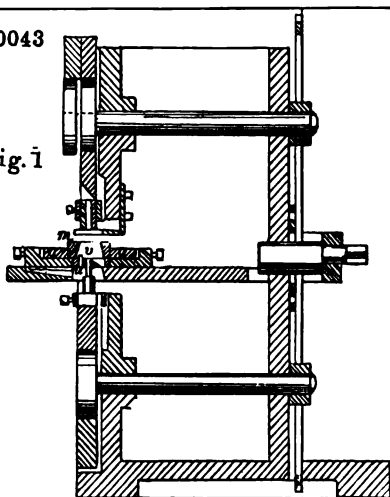
22155





20043

fig. 1



21951

fig. 1

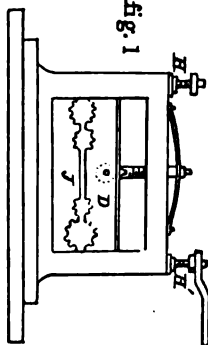
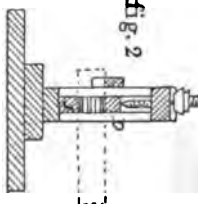


fig. 2



19861

fig. 1

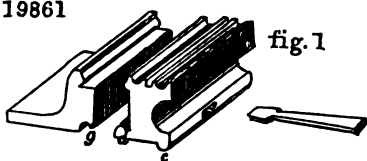
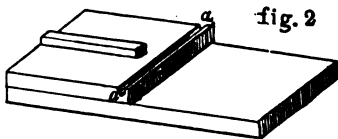


fig. 2



22111

fig. 1

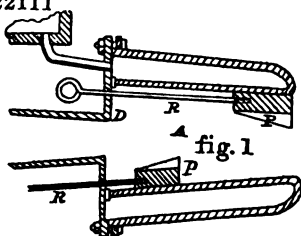
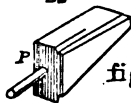
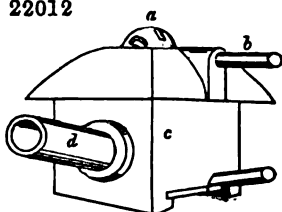


fig. 2



22012



19622

fig. 1

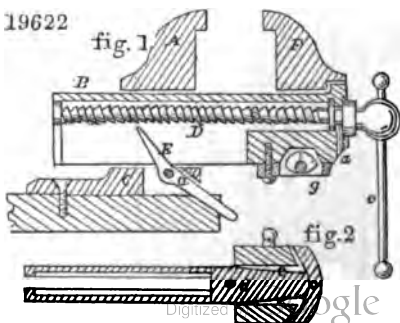


fig. 2

21359

fig. 1

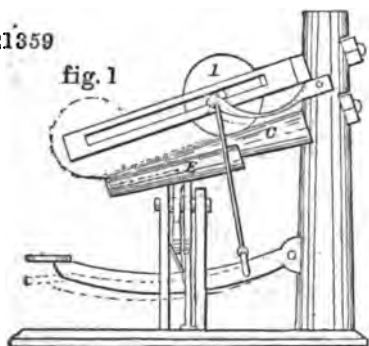
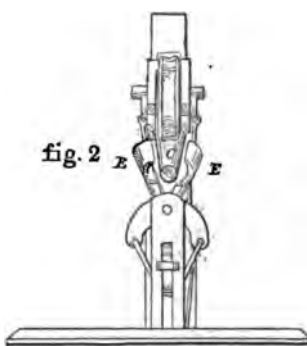


fig. 2



21866

fig. 1

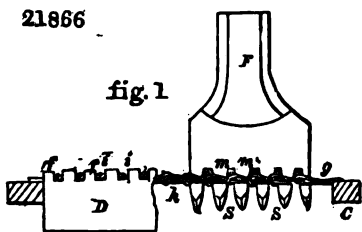
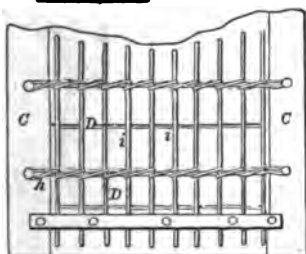


fig. 2



21635

fig. 1

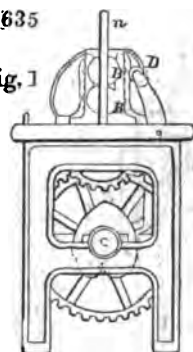
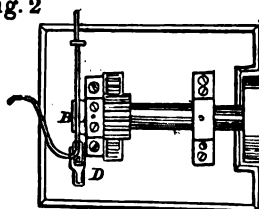
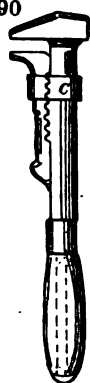


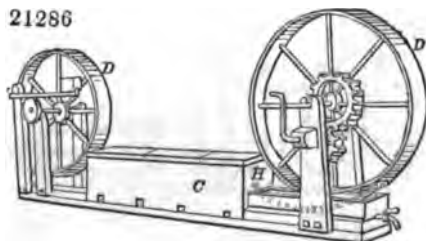
fig. 2



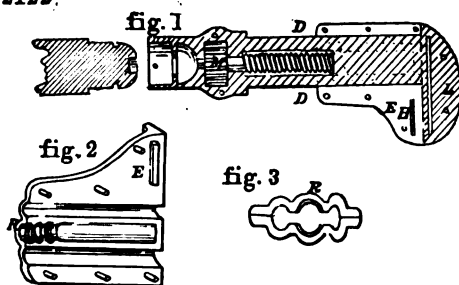
19790



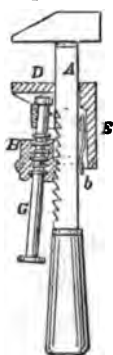
21286



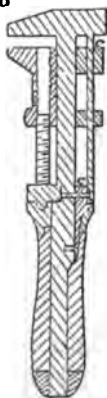
22122.



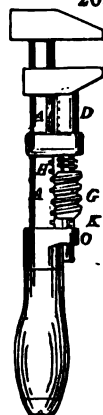
19954



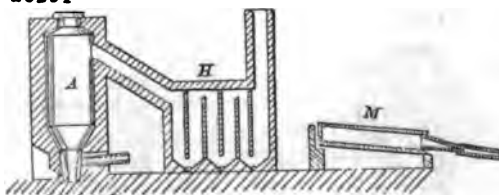
21196



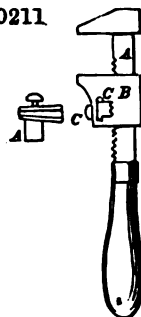
20379



20291



20211



19231

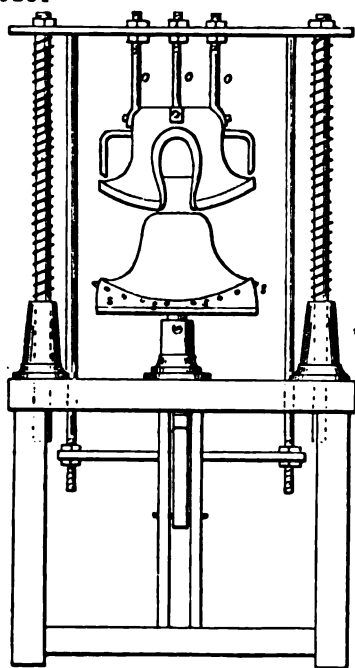


fig. 1

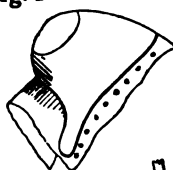


fig. 2

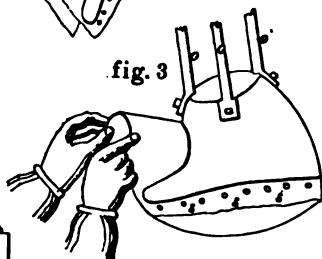
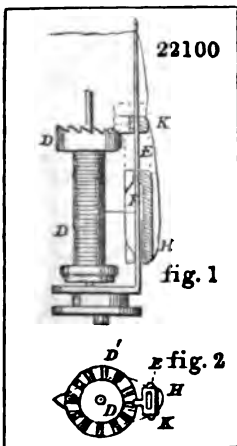
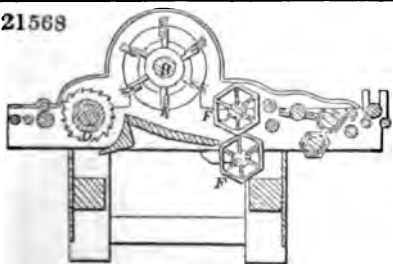


fig. 3

21568



22100

fig. 1

fig. 2

20837

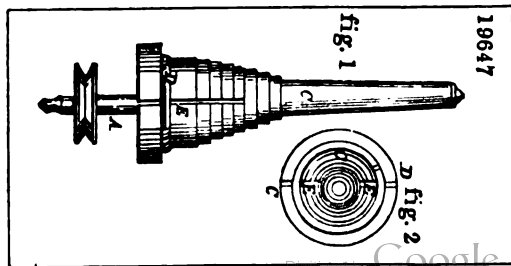
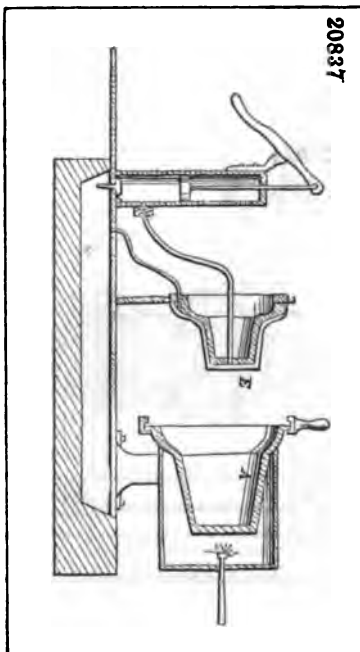


fig. 1

fig. 2

19647

20695

fig. 1

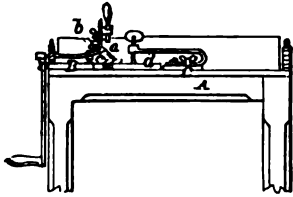
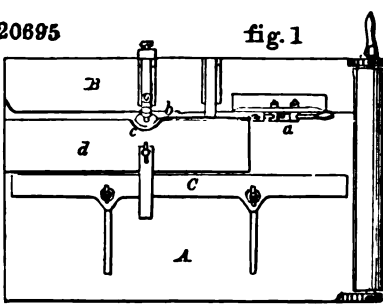


fig. 2

21364

fig. 1

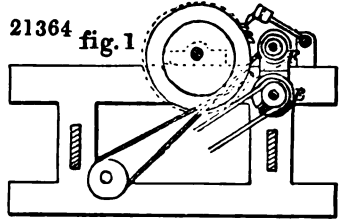
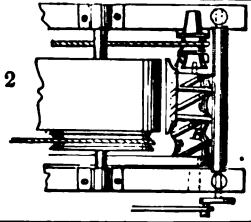
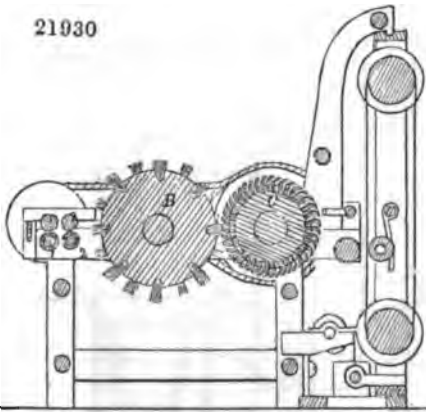


fig. 2



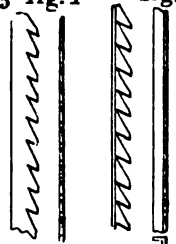
21030



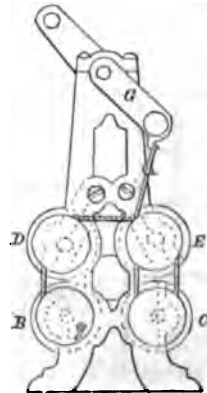
19585

fig. 1

fig. 2



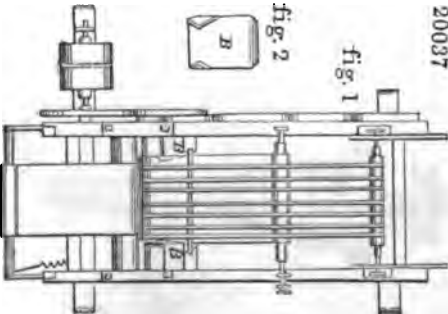
21931



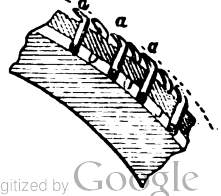
20037

fig. 1

fig. 2



21685



20677

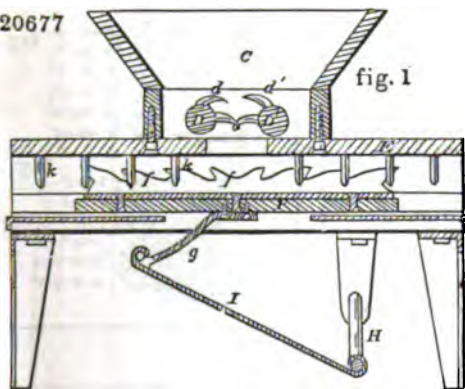
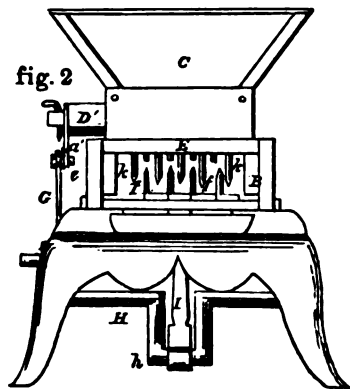


fig. 1

fig. 2



19554

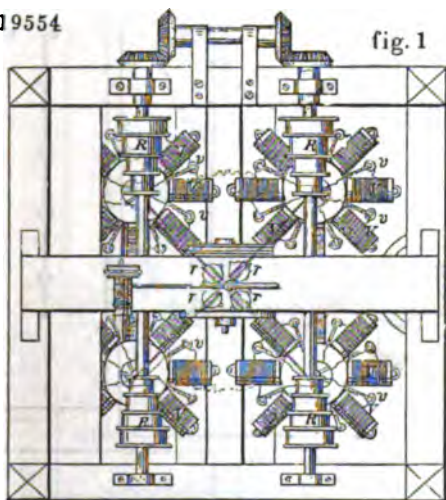
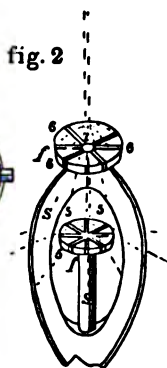


fig. 1

fig. 2



20690

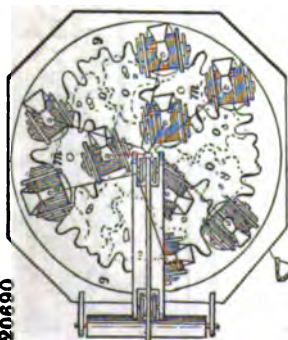
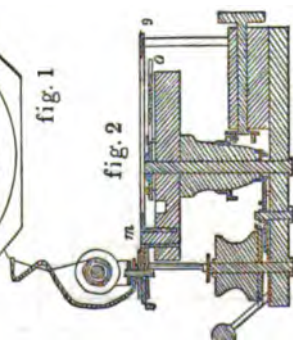


fig. 1

fig. 2



20691

fig. 1

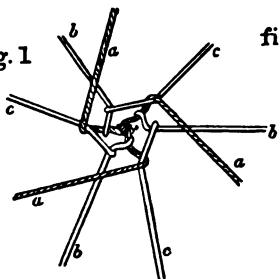


fig. 2



20267

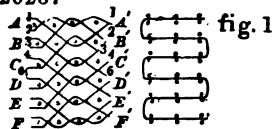
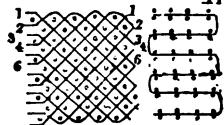
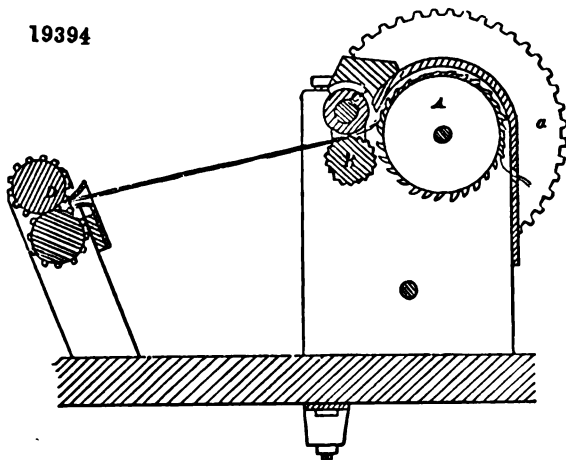


fig. 2



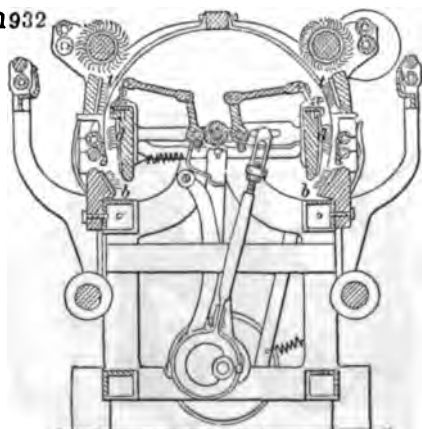
19394



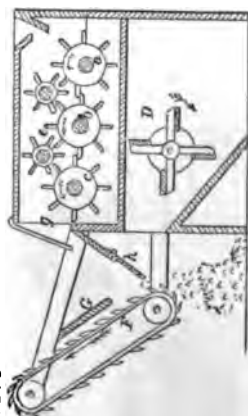
20263

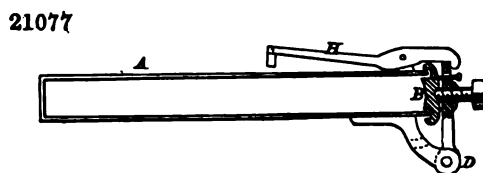
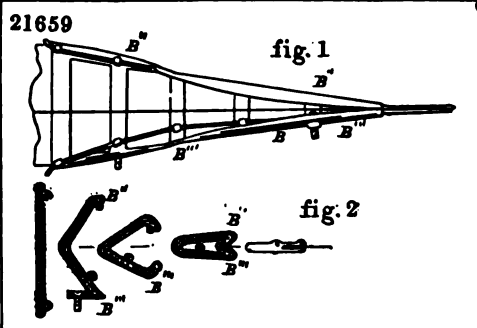
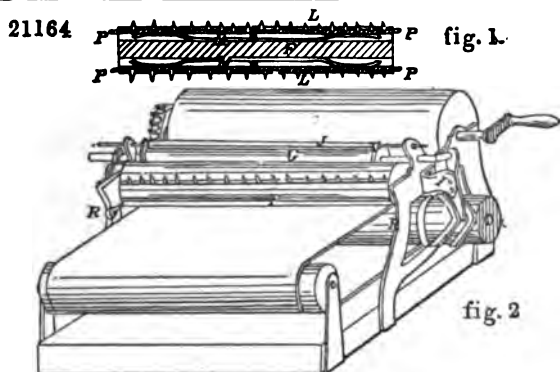


21932

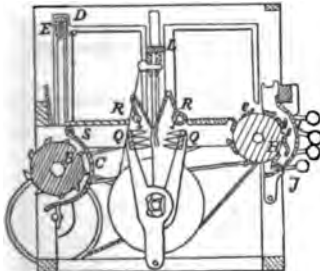


20270

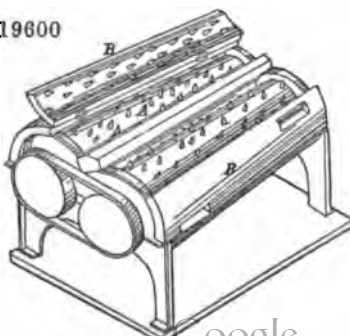




21771



19600





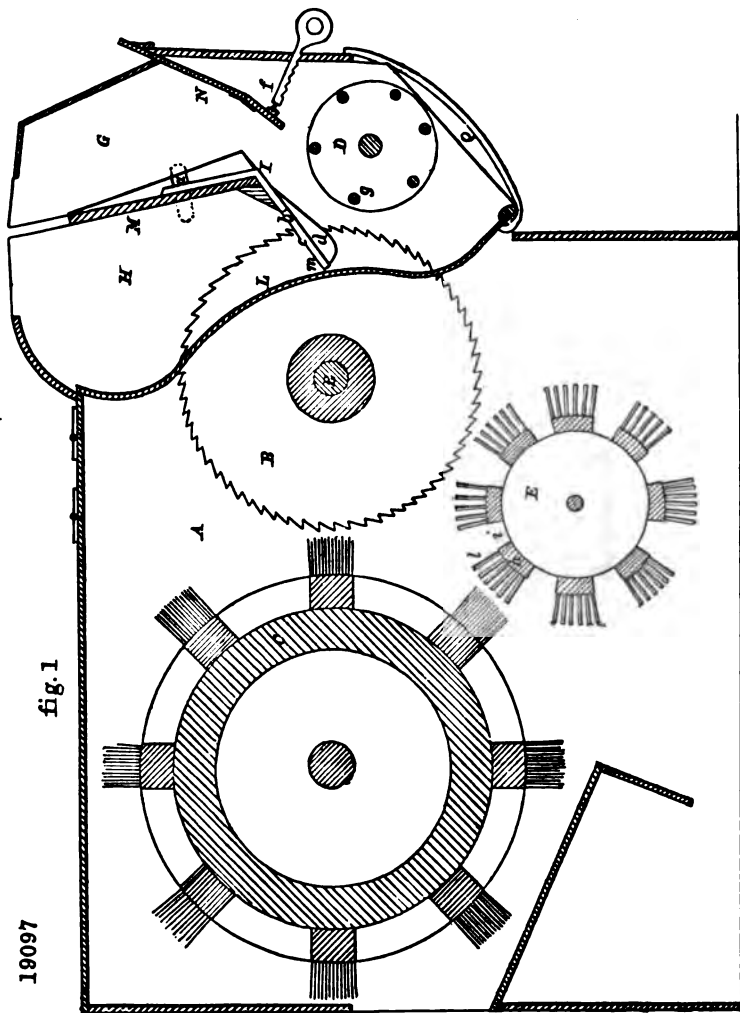


fig. 1

19097

ad 19097

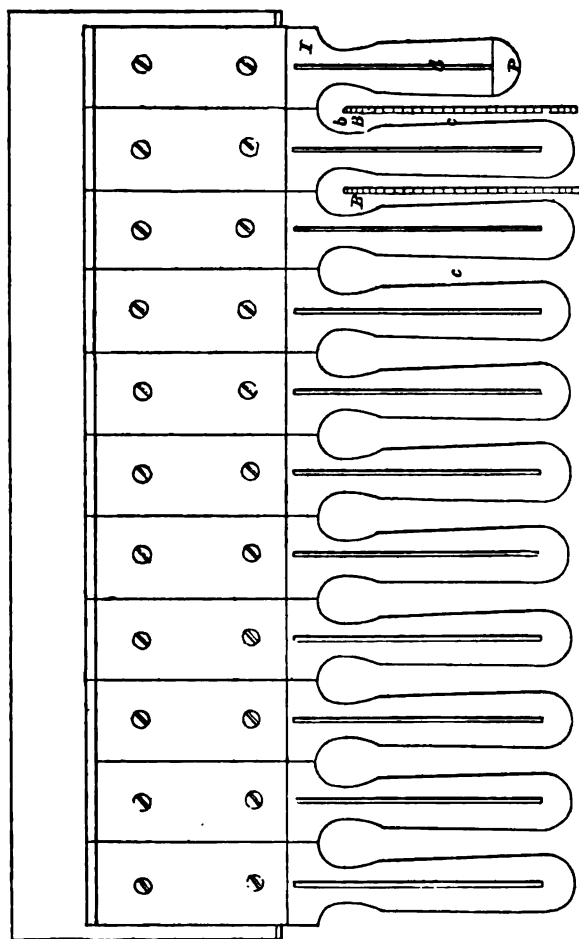


fig. 2

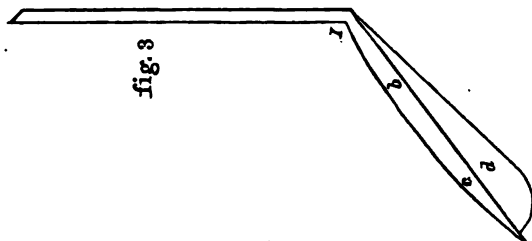
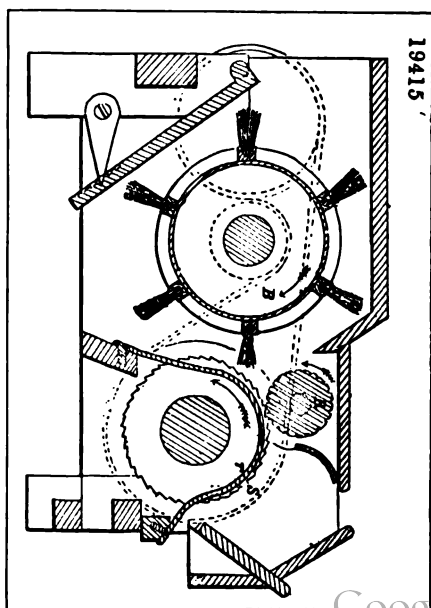
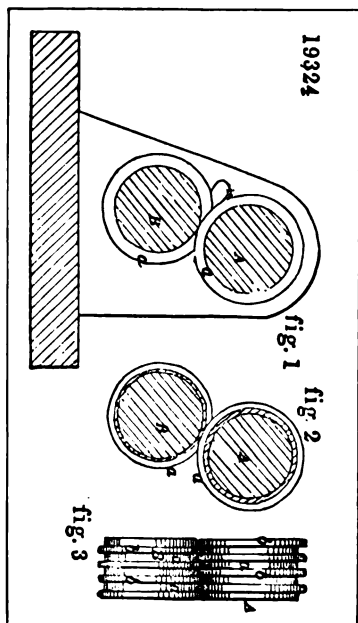
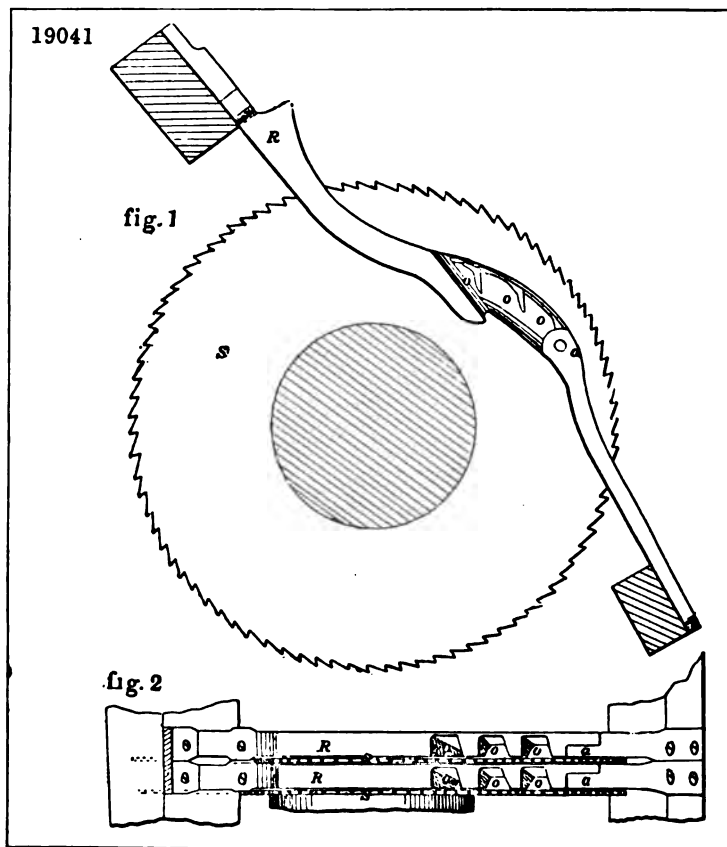


fig. 3



20120

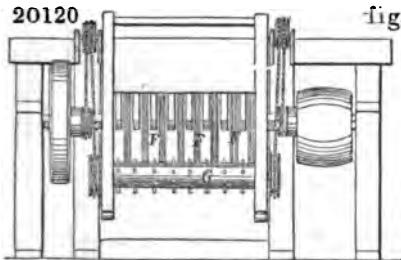


fig. 1

fig. 2

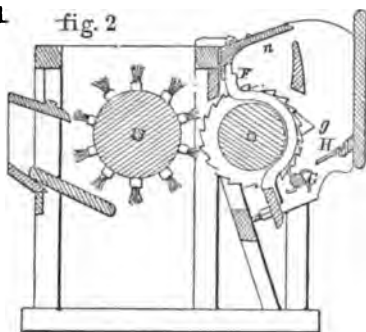
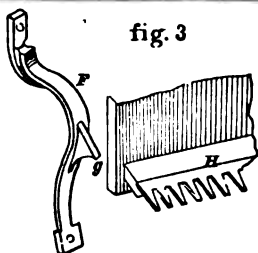
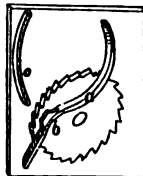


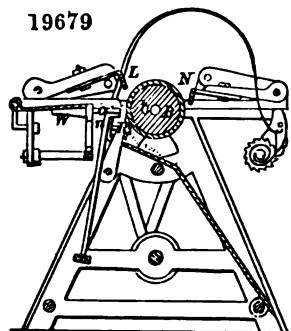
fig. 3



20051



19679



19598

fig. 1

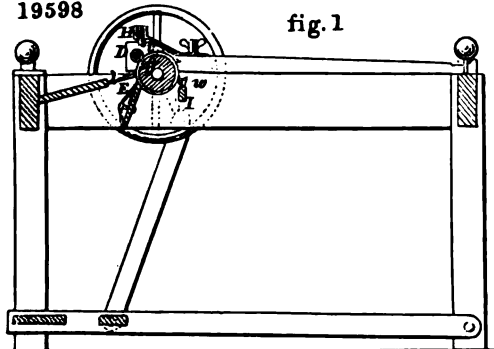
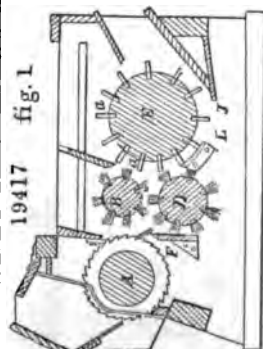
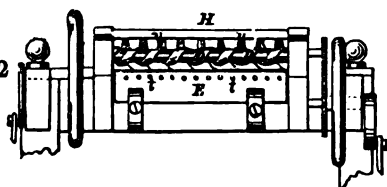
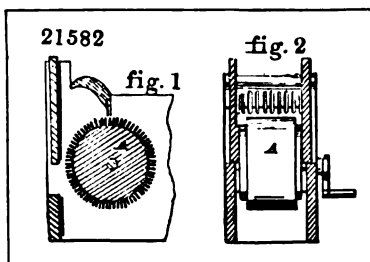
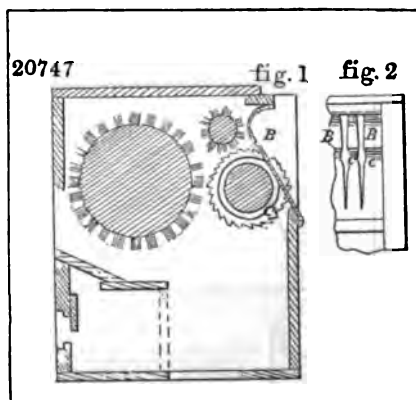
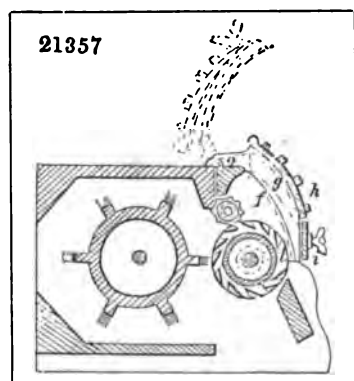
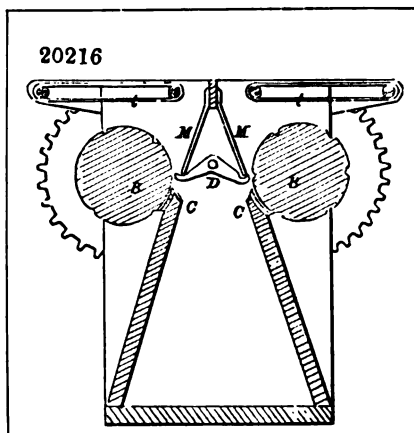
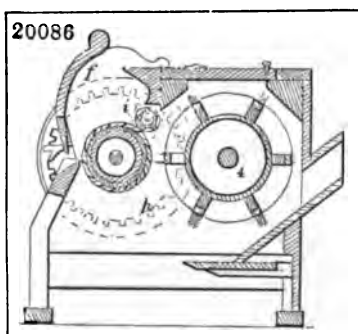
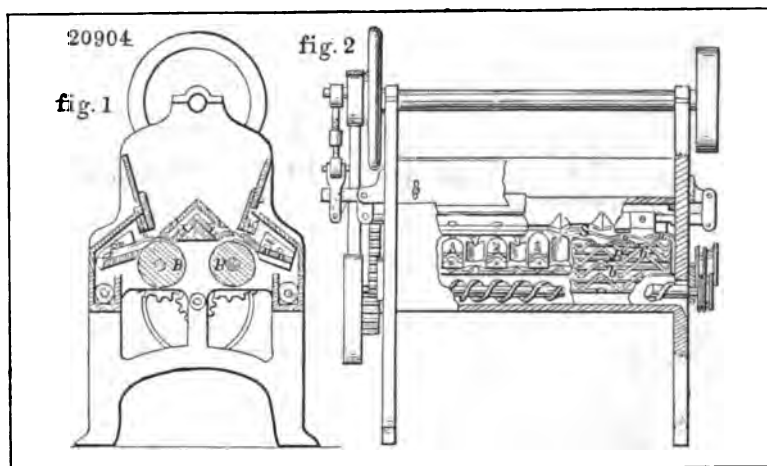


fig. 2





21714

fig. 1

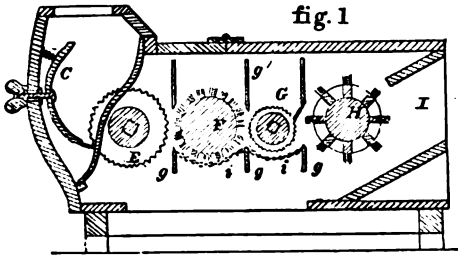
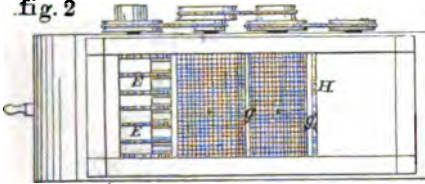


fig. 2



20602

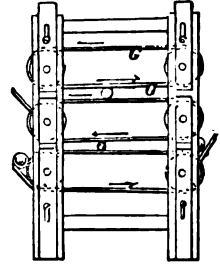


fig. 1

19616

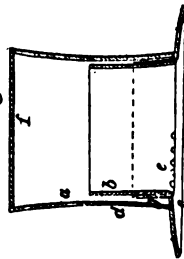
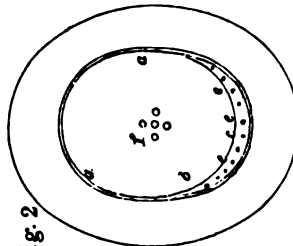


fig. 2



21795

fig. 1

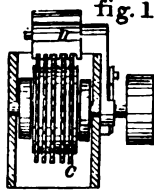
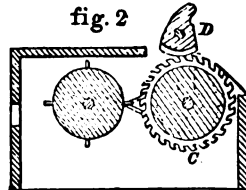
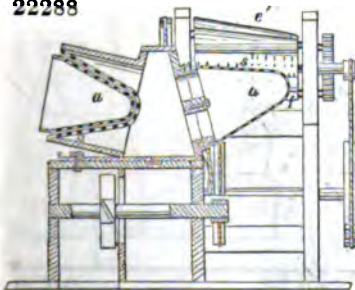


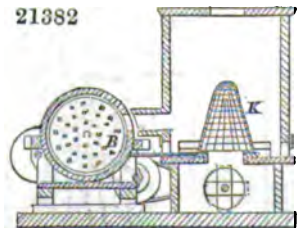
fig. 2



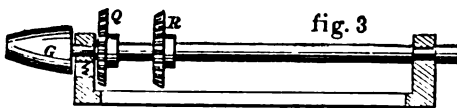
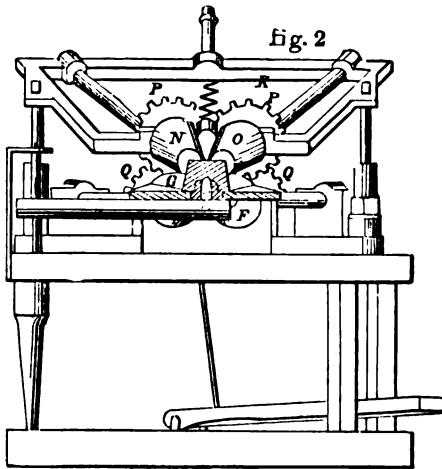
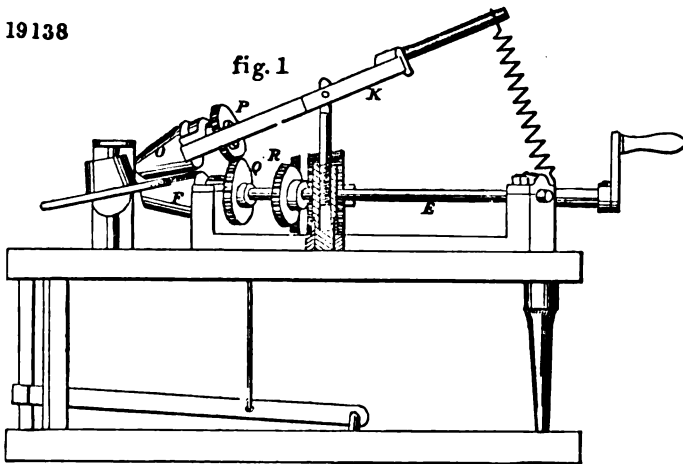
22288



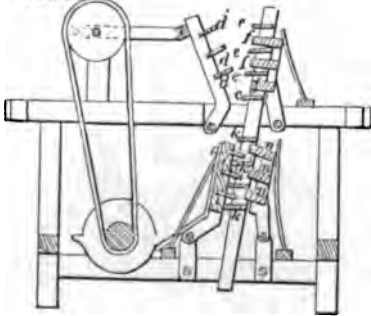
21382



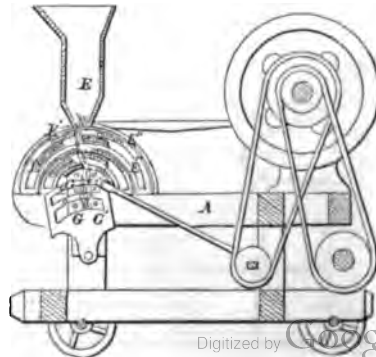
19138



21513



20890



19255

fig. 1

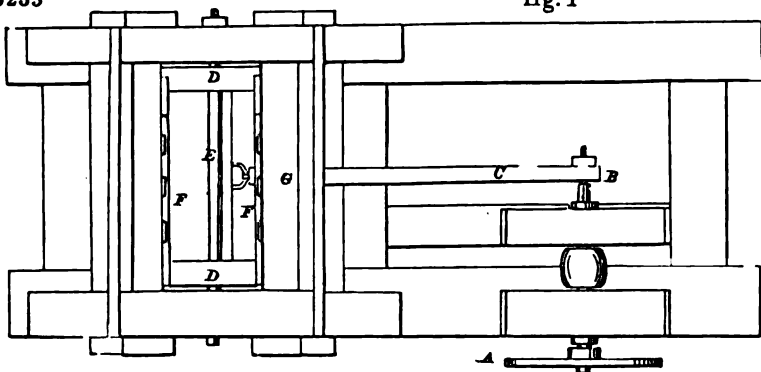


fig. 2

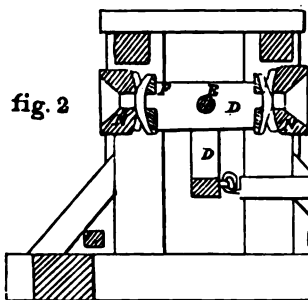
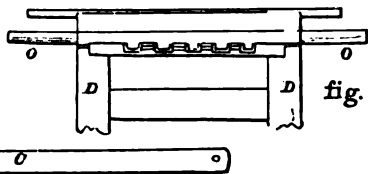


fig. 3



21983

fig. 1

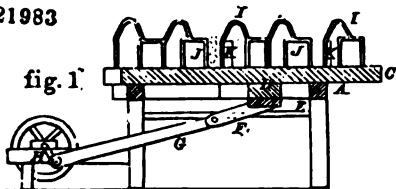
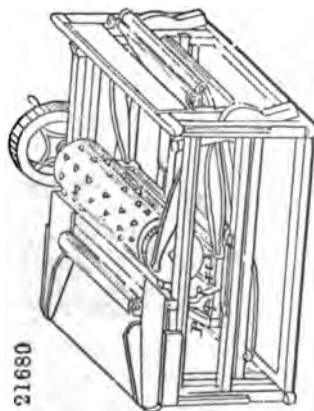
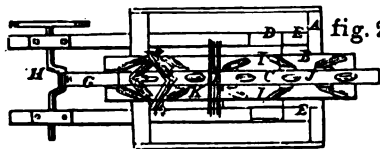


fig. 2



21680

22399

fig. 1

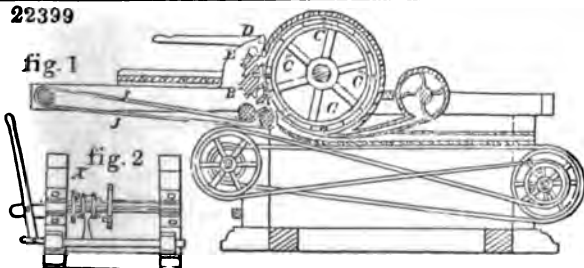
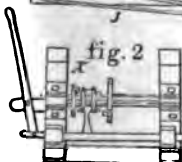


fig. 2





19370

fig. 1

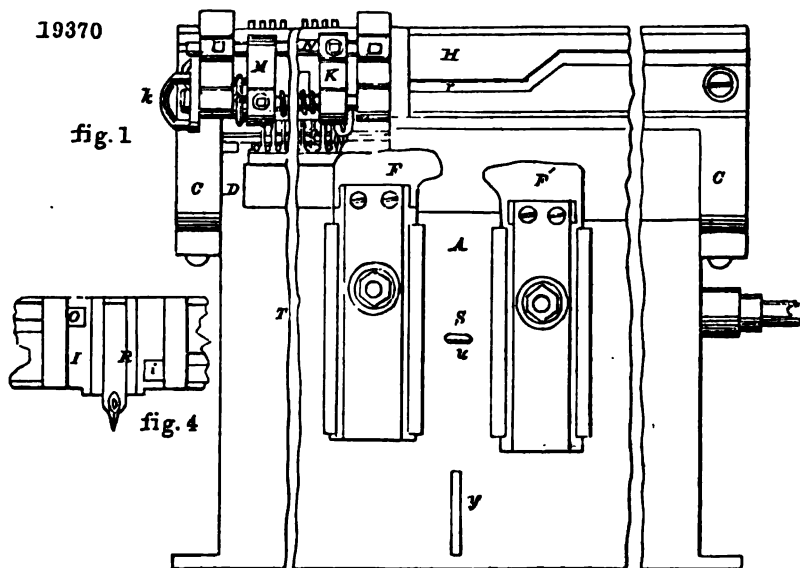


fig. 4

fig. 3

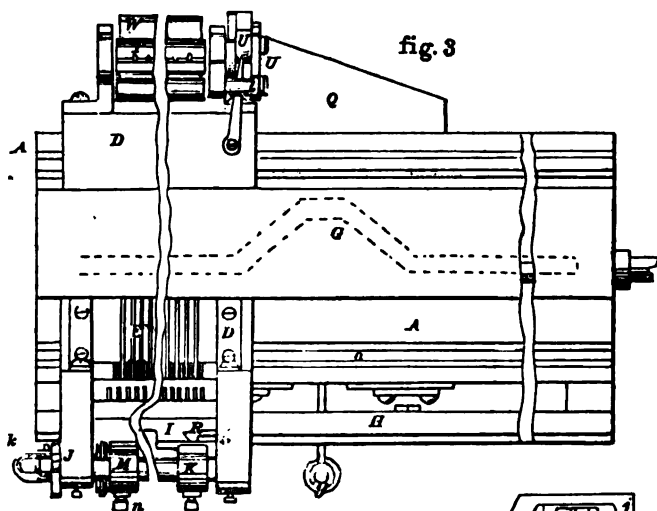
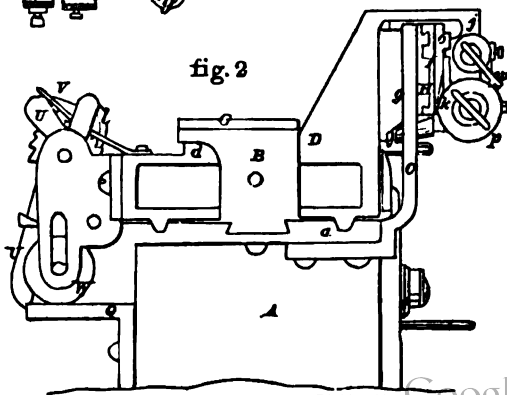
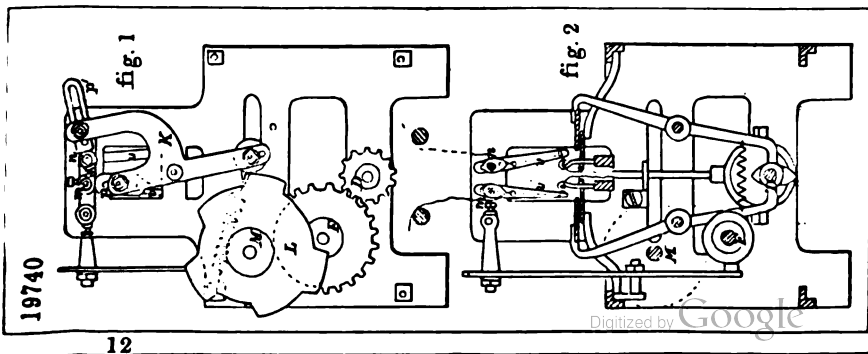
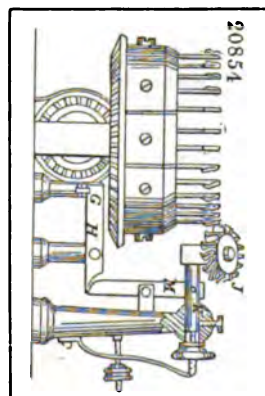
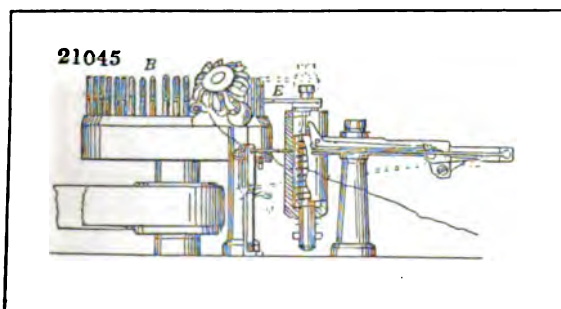
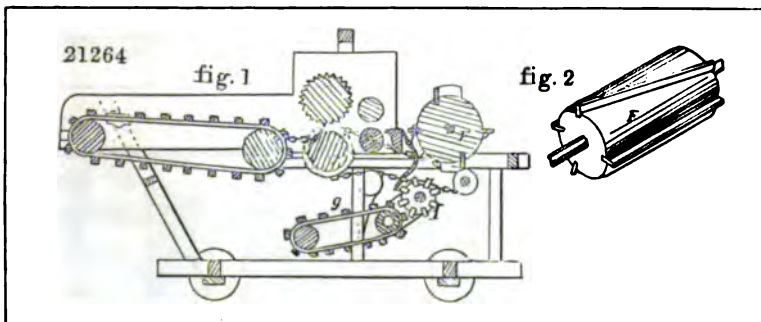
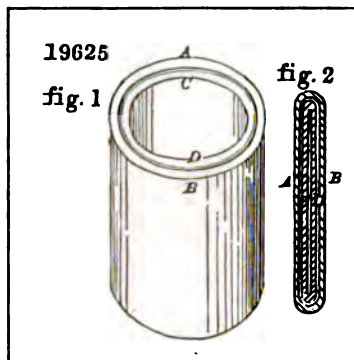
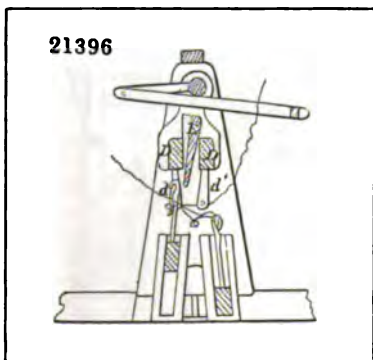


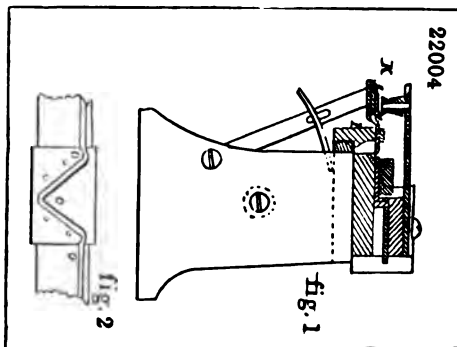
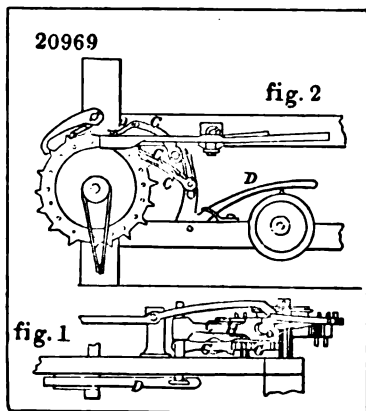
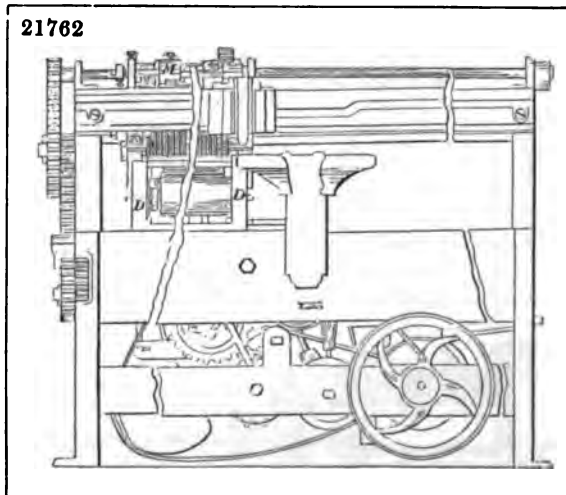
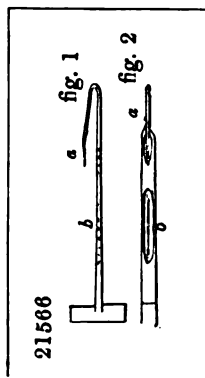
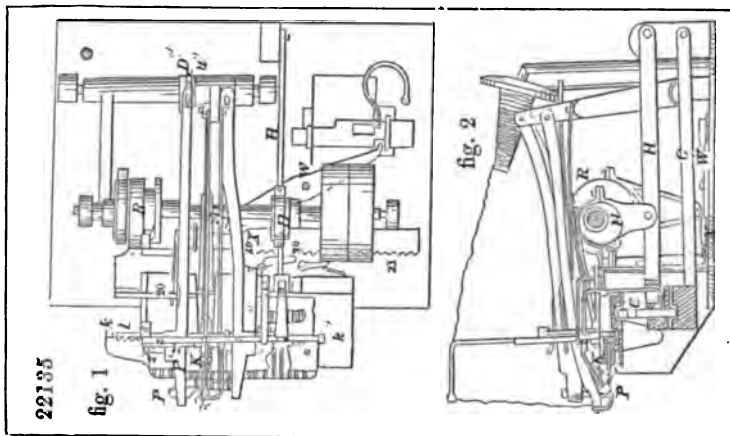
fig. 2



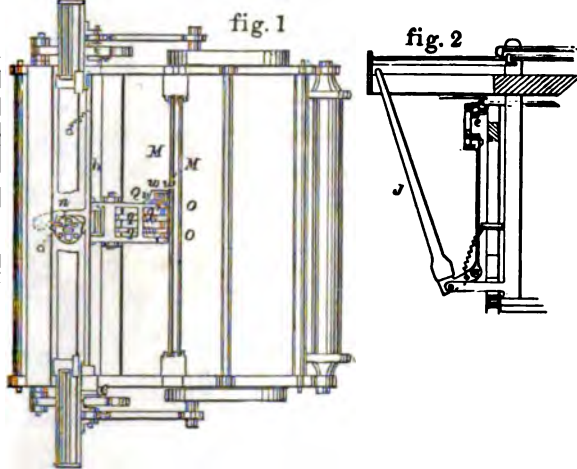
20893



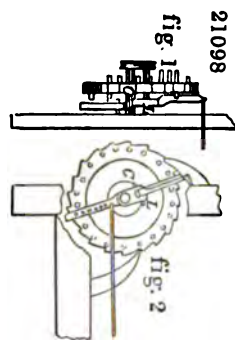




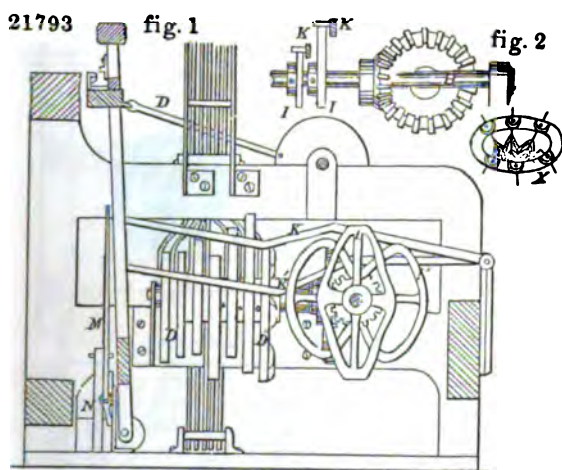
21448



21098



21793



20044

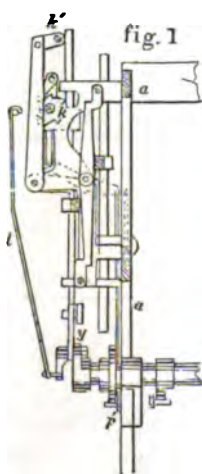
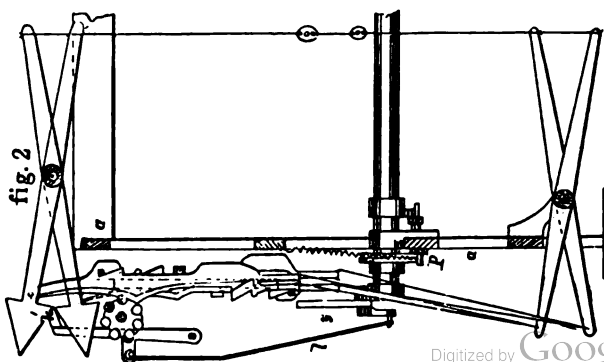


fig. 2



19719

fig. 1

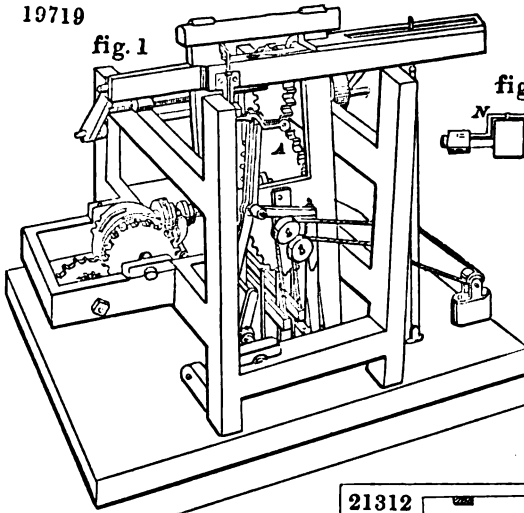


fig. 2

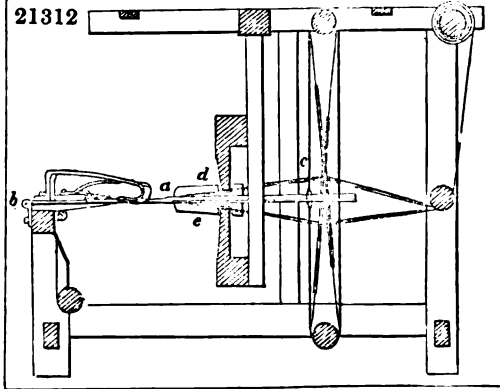


fig. 2

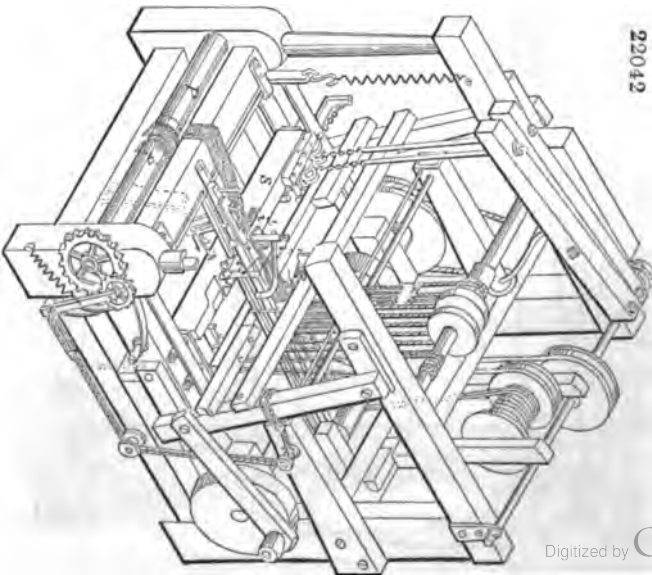


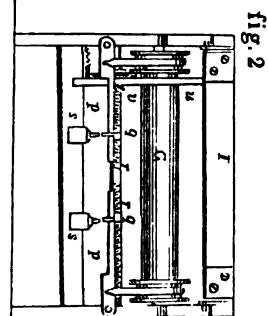
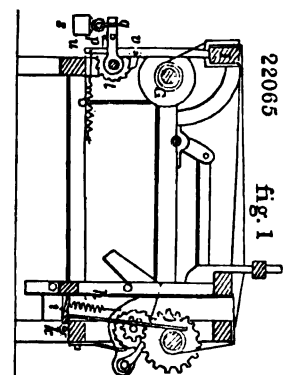
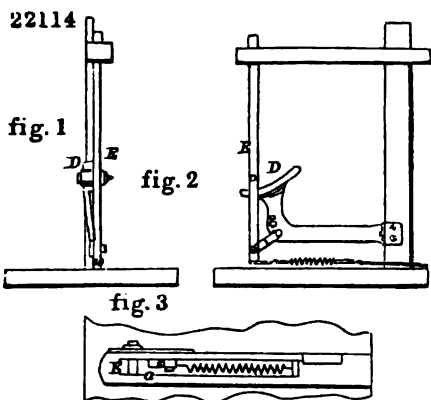
19428

21312

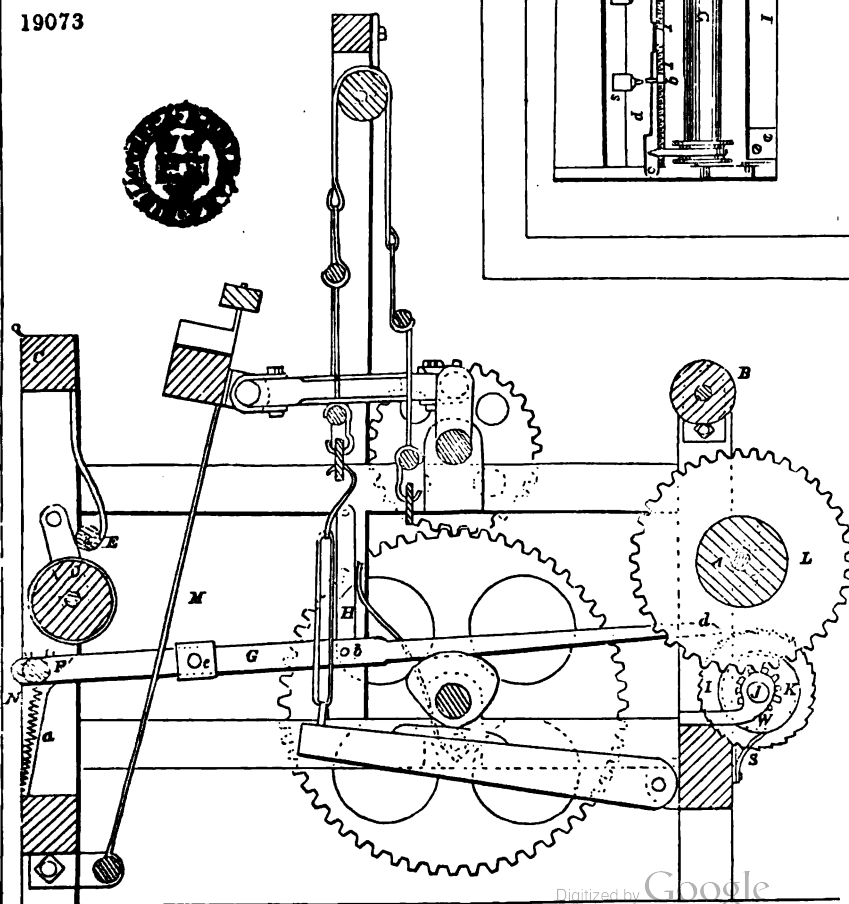


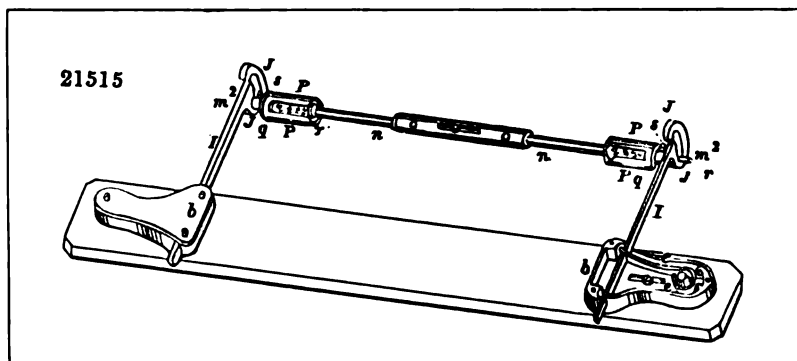
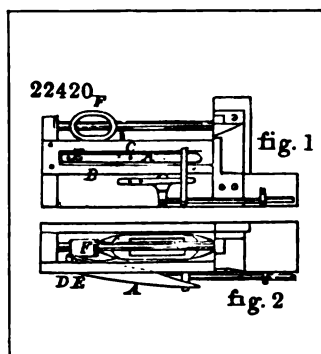
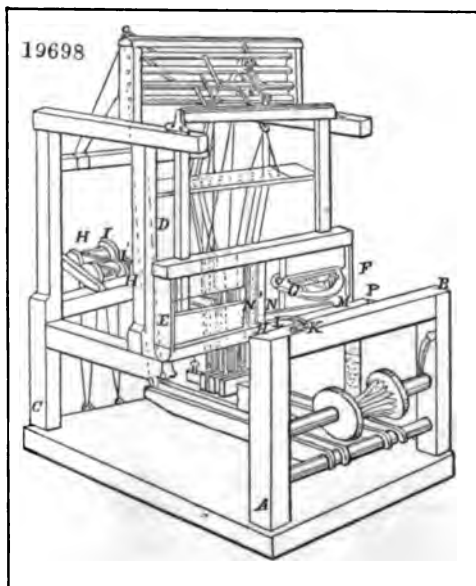
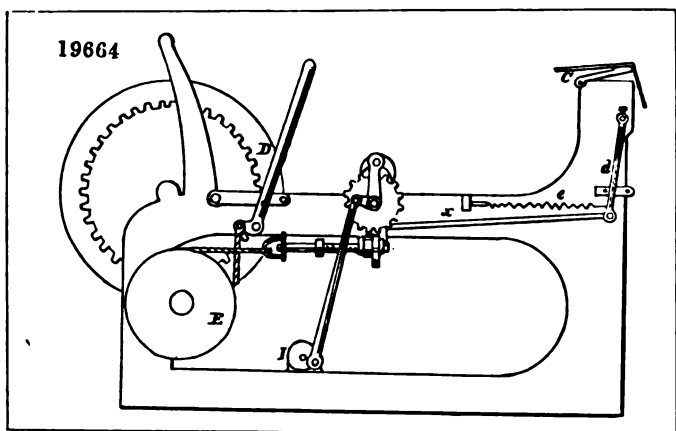
22042

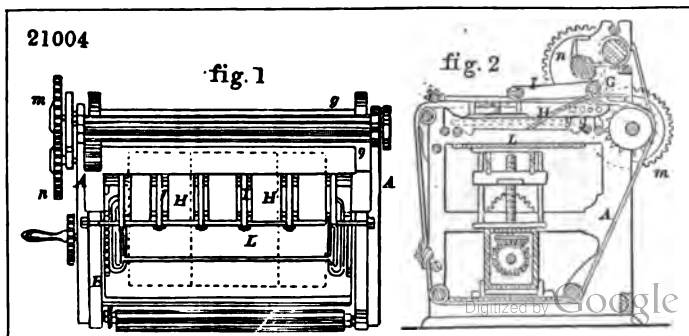
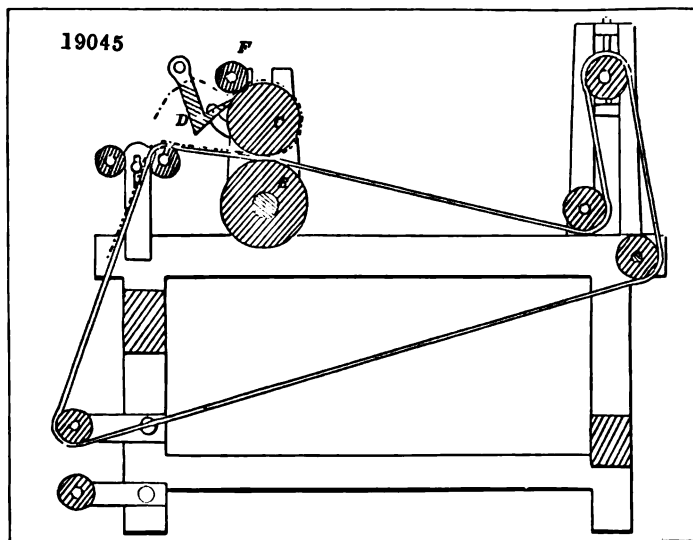
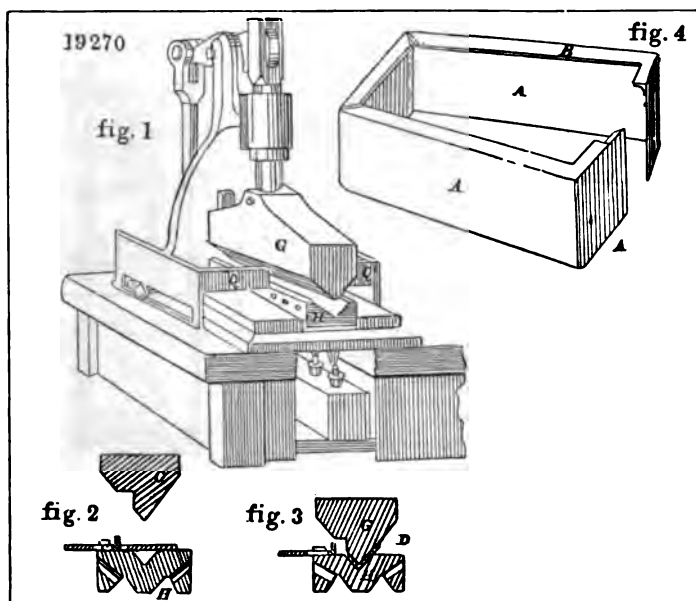




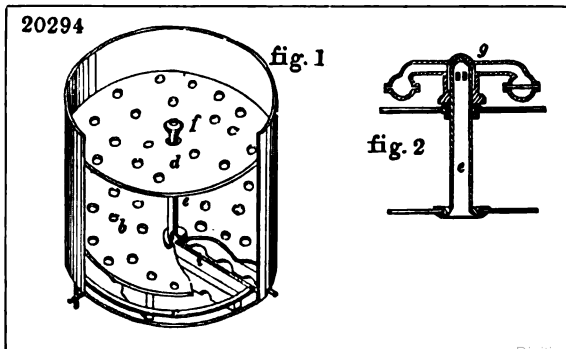
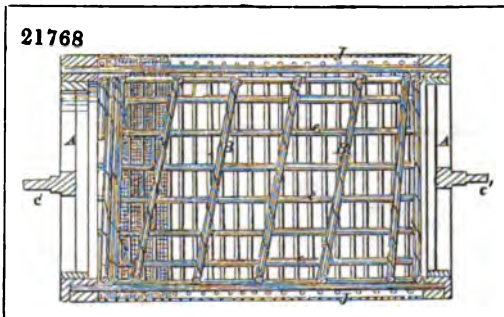
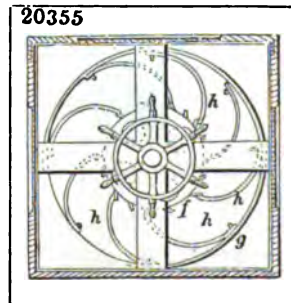
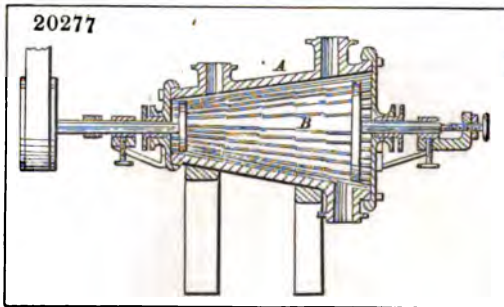
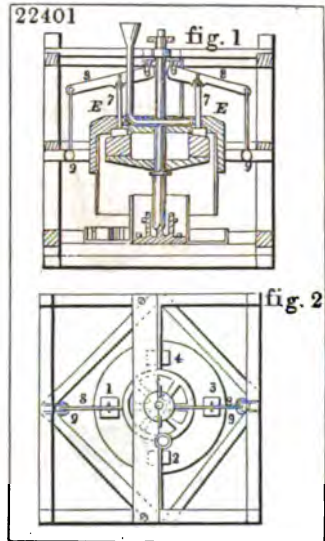
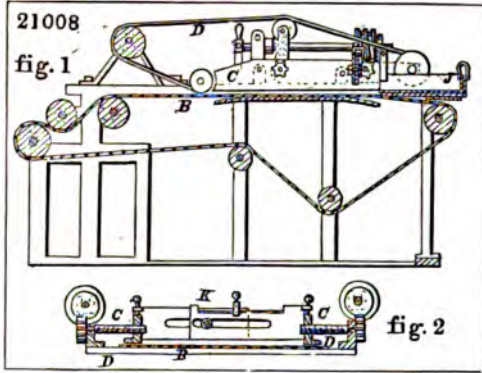
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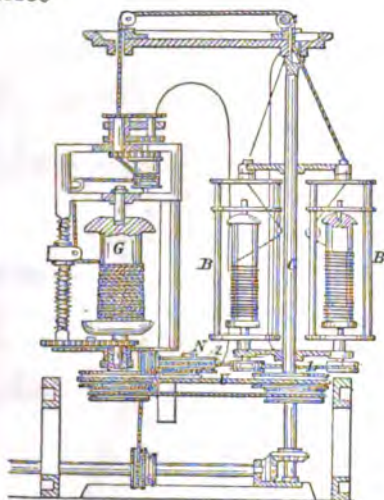




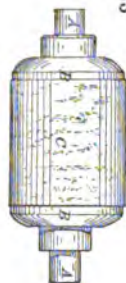




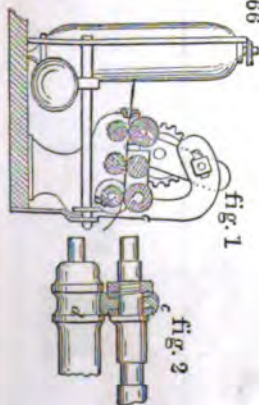
21238



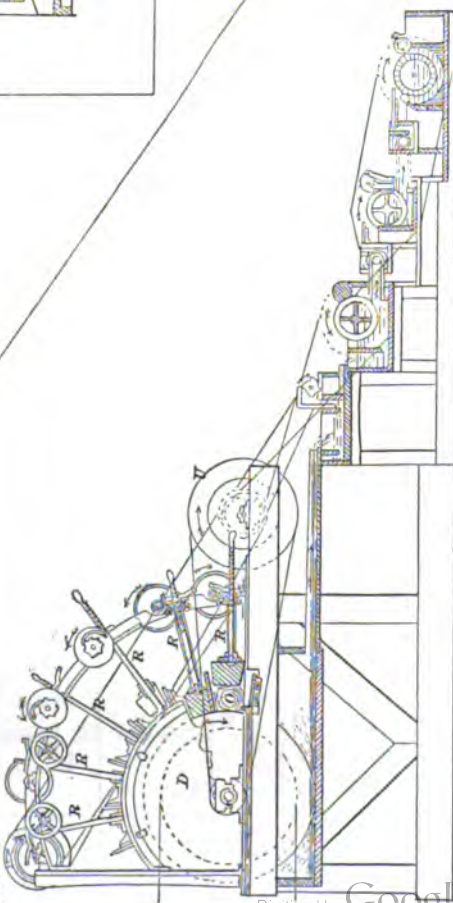
19623

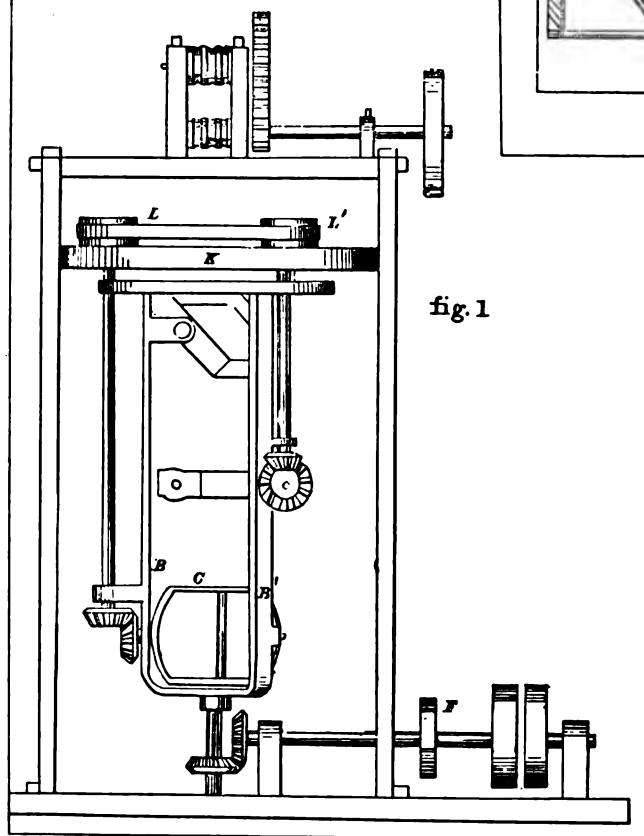
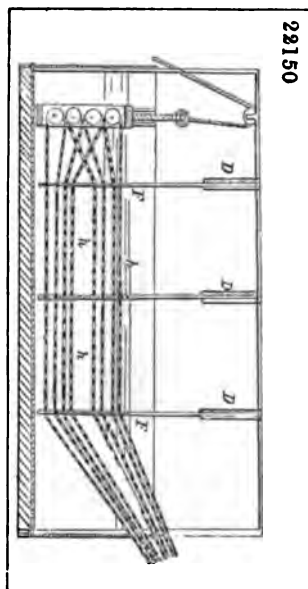
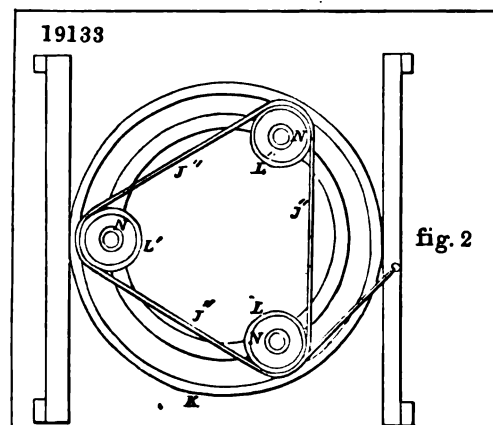


20766



21112





19059

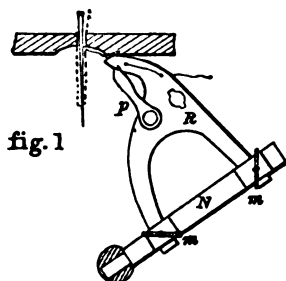


fig. 2

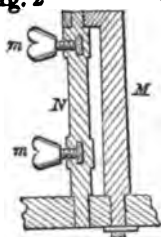
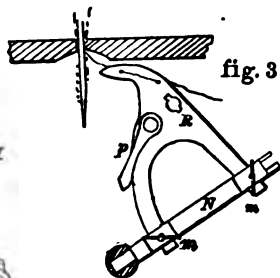
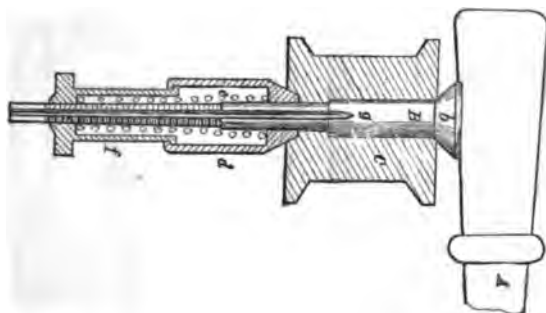


fig. 3



19080



19015

fig. 1

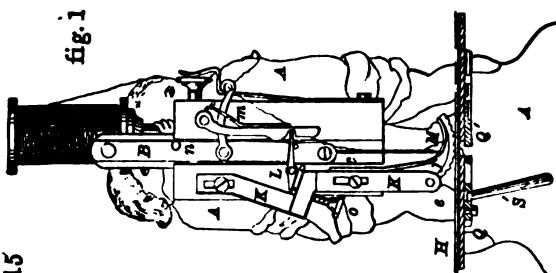
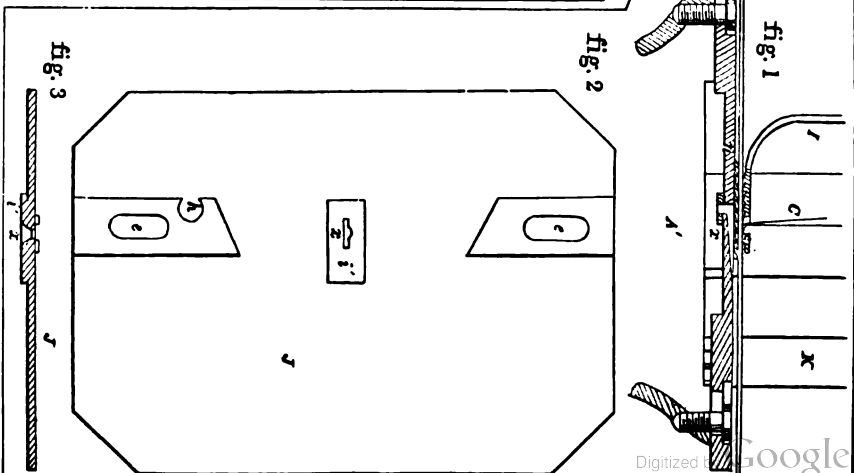
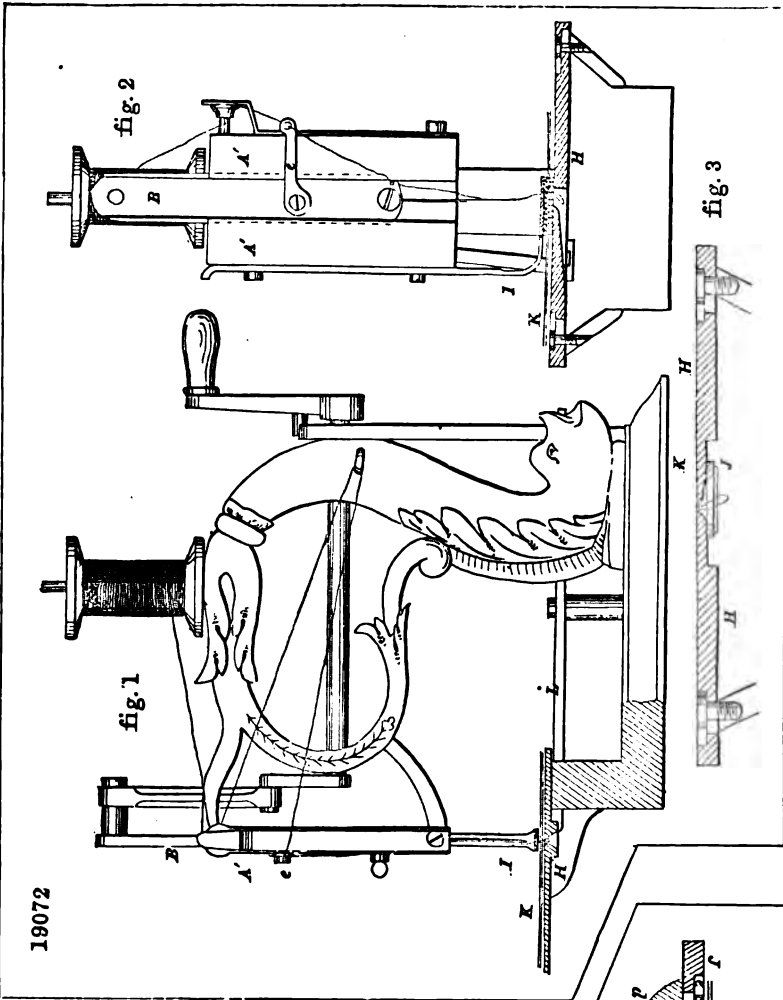


fig. 2





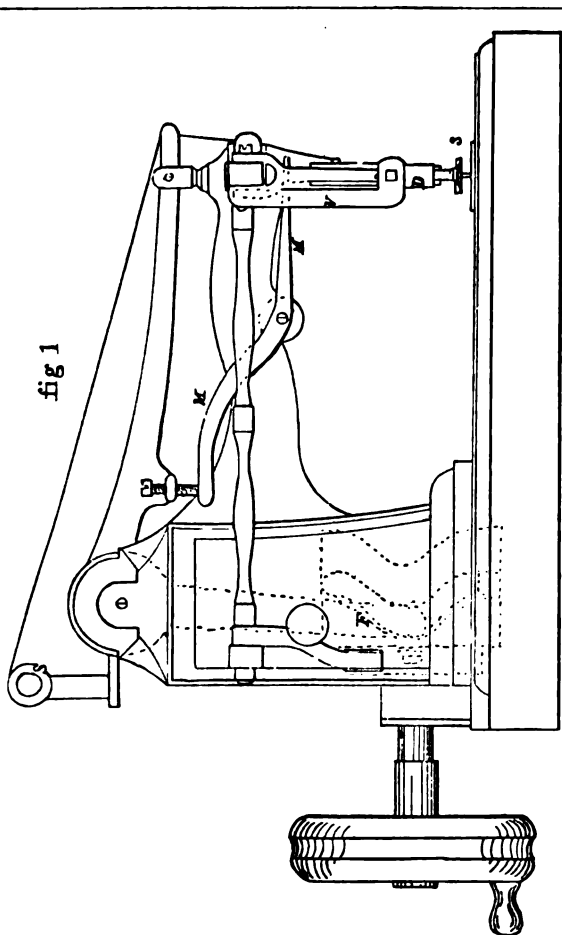


fig 1

19141

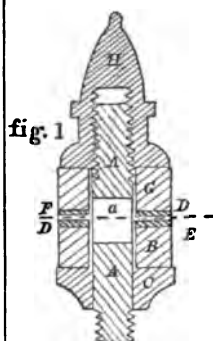


fig. 1

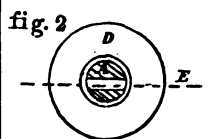


fig. 2

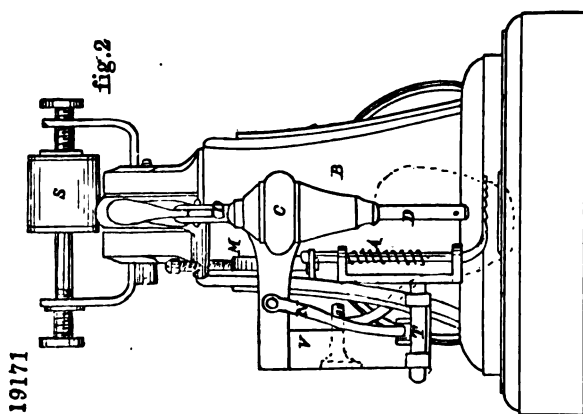


fig. 2

19171

19155

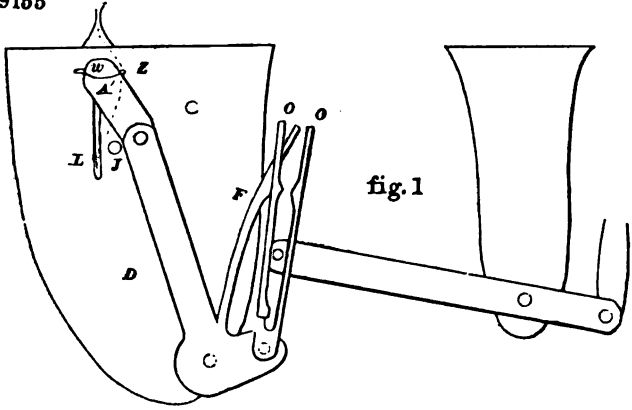


fig. 1

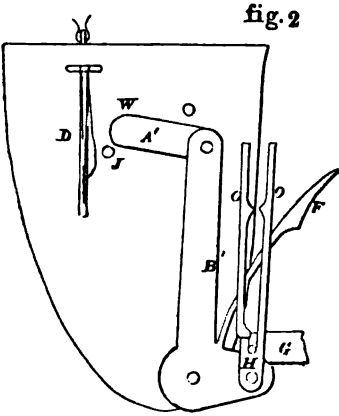


fig. 2

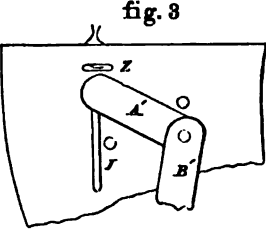


fig. 3

19135

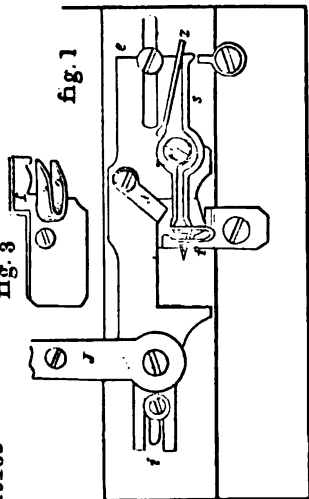


fig. 1

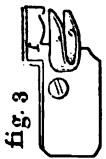


fig. 3

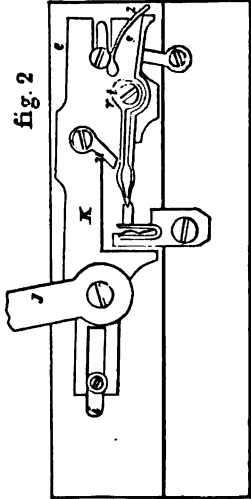
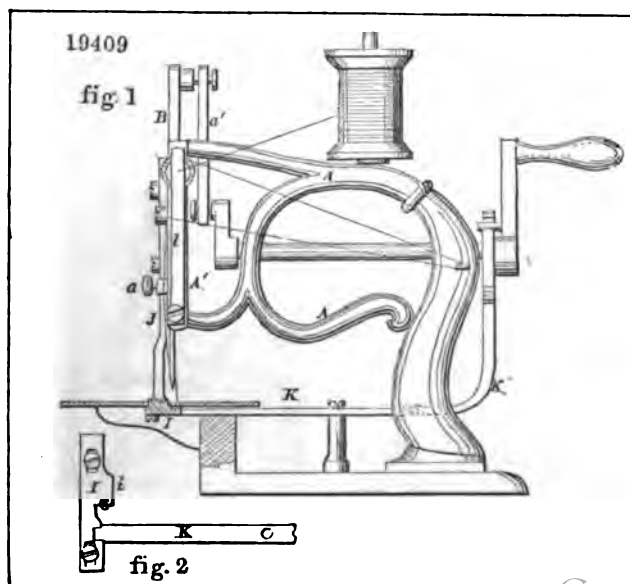
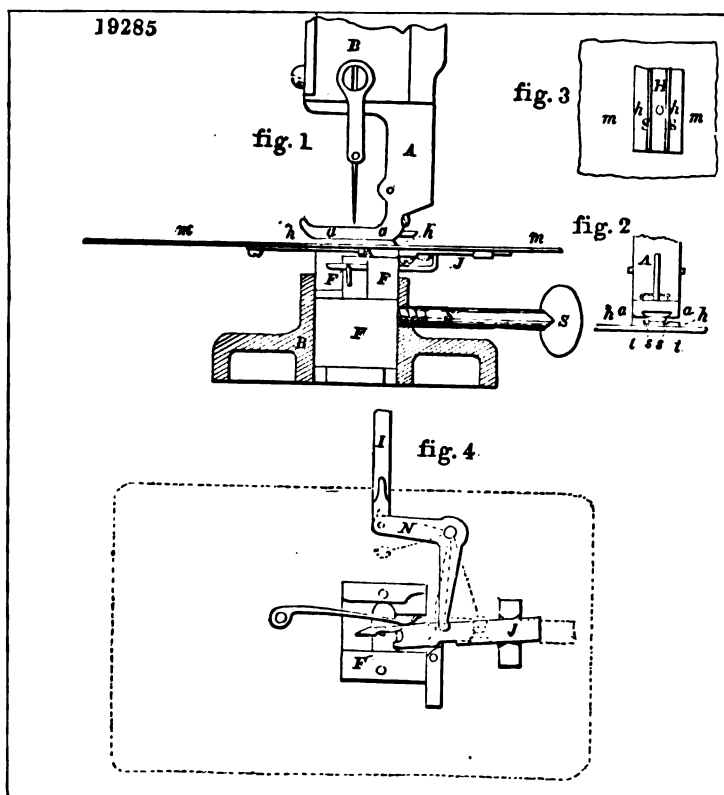
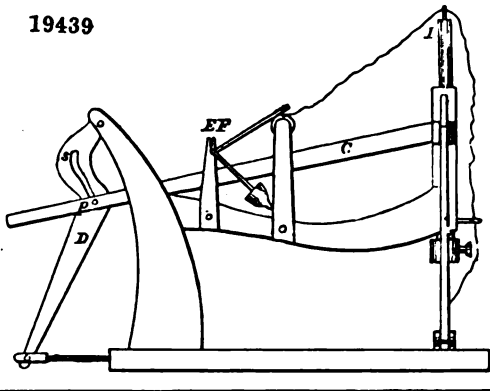


fig. 2

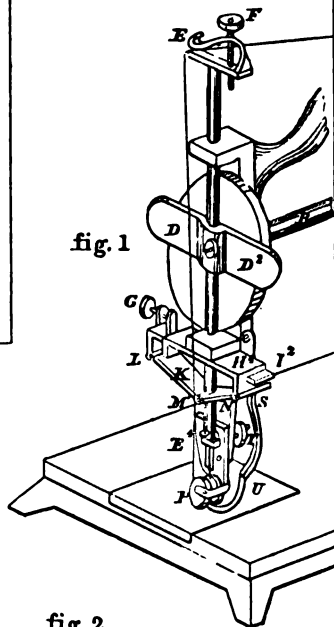




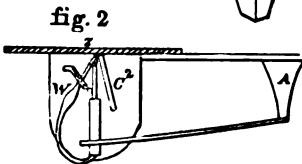
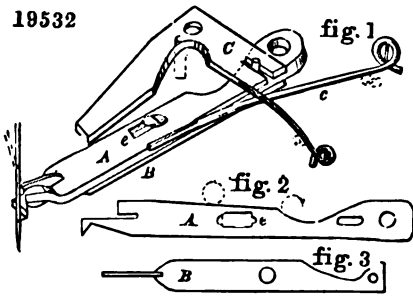
19439



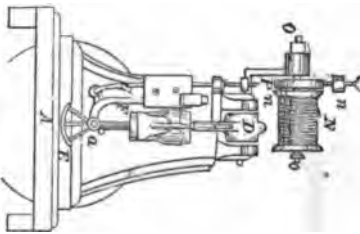
19535



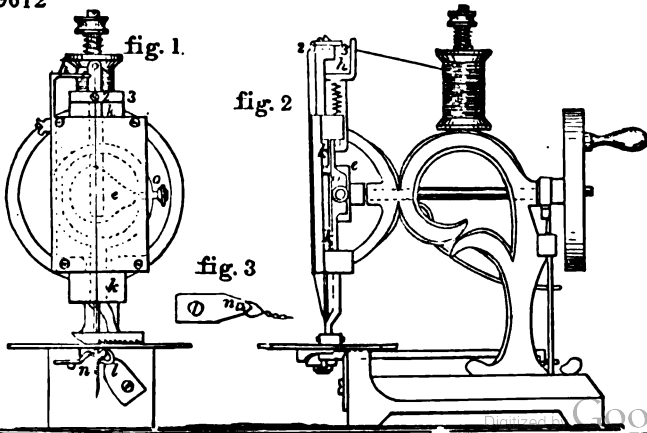
19532

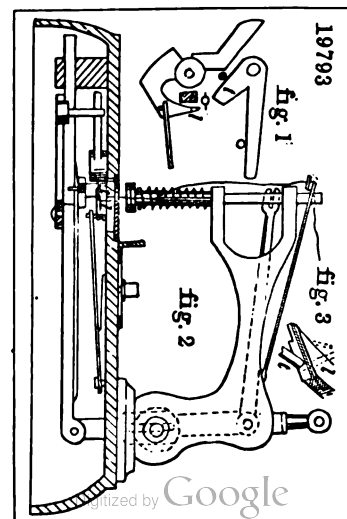
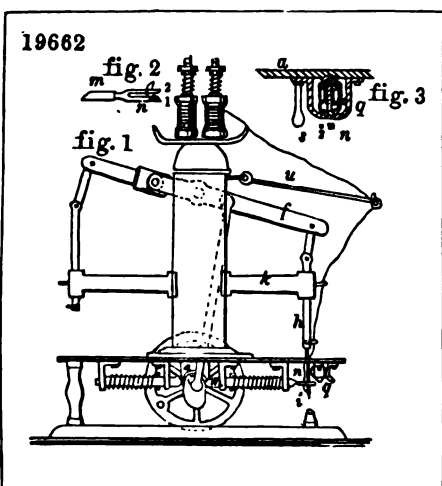
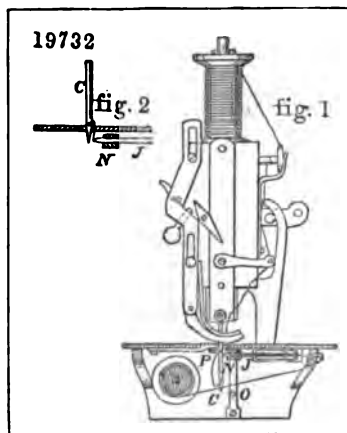
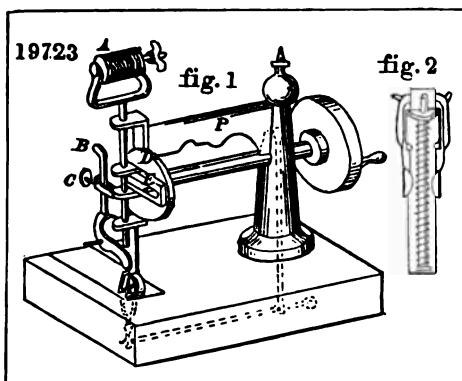
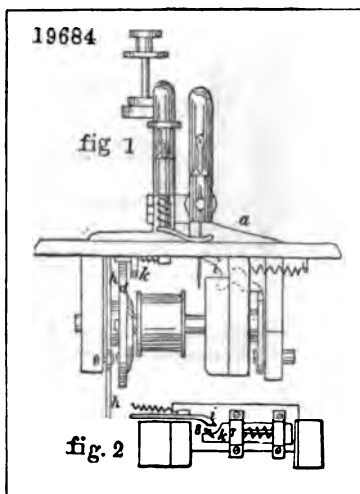
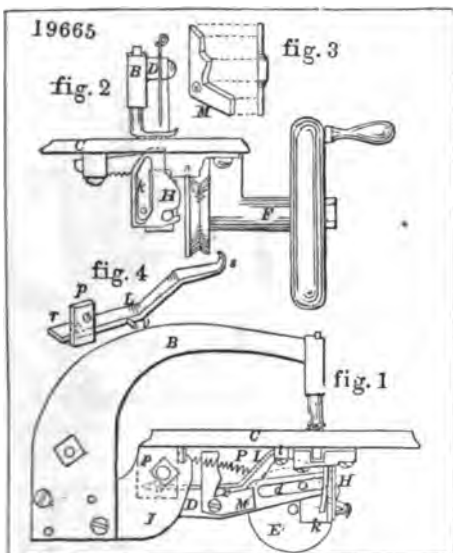


19660

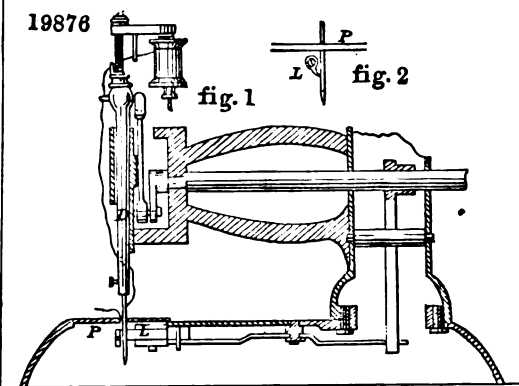


19612

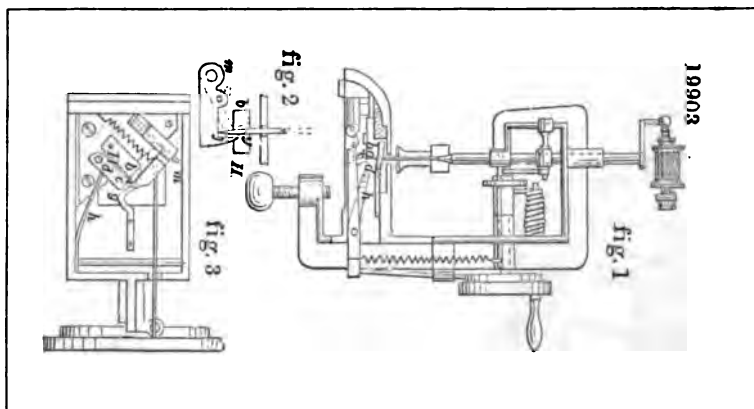
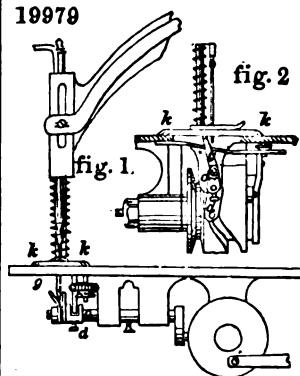




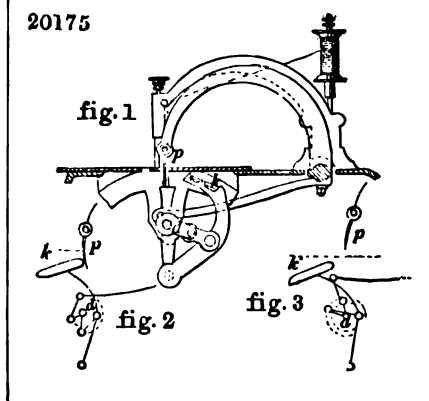
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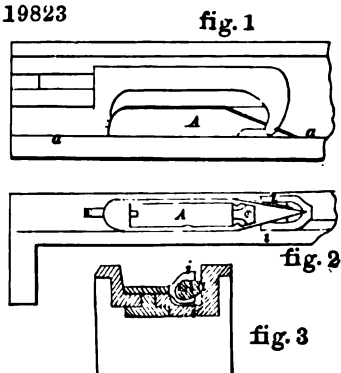
19979



20175



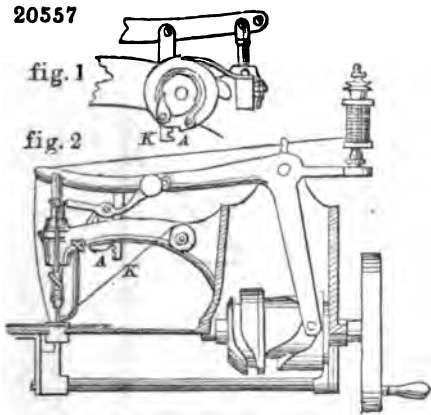
19823



20557

fig. 1

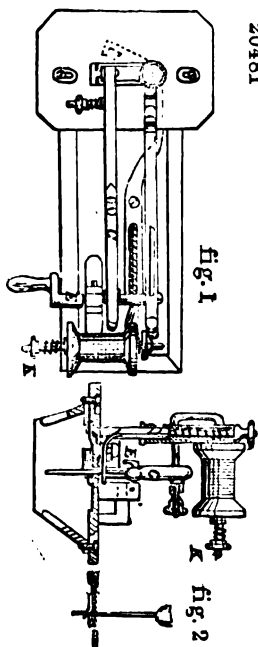
fig. 2



20481

fig. 1

fig. 2



20471

fig. 1

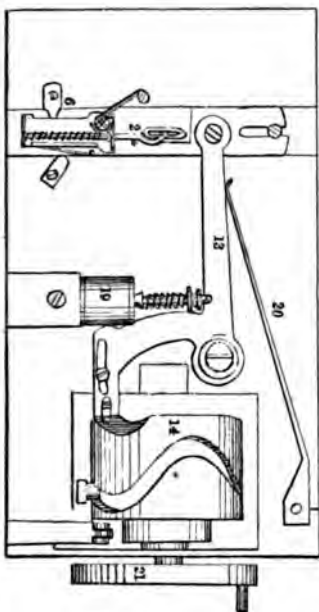
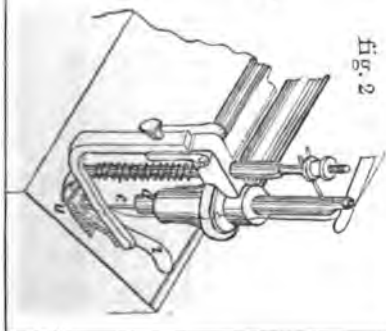


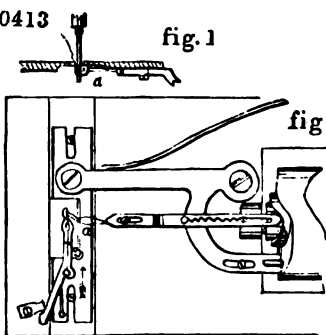
fig. 2



20413

fig. 1

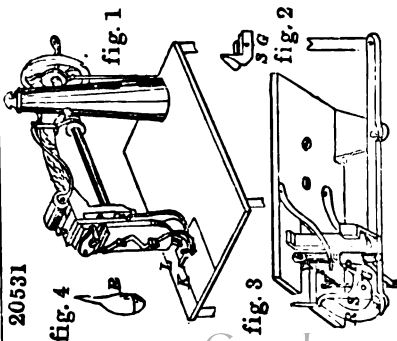
fig. 2

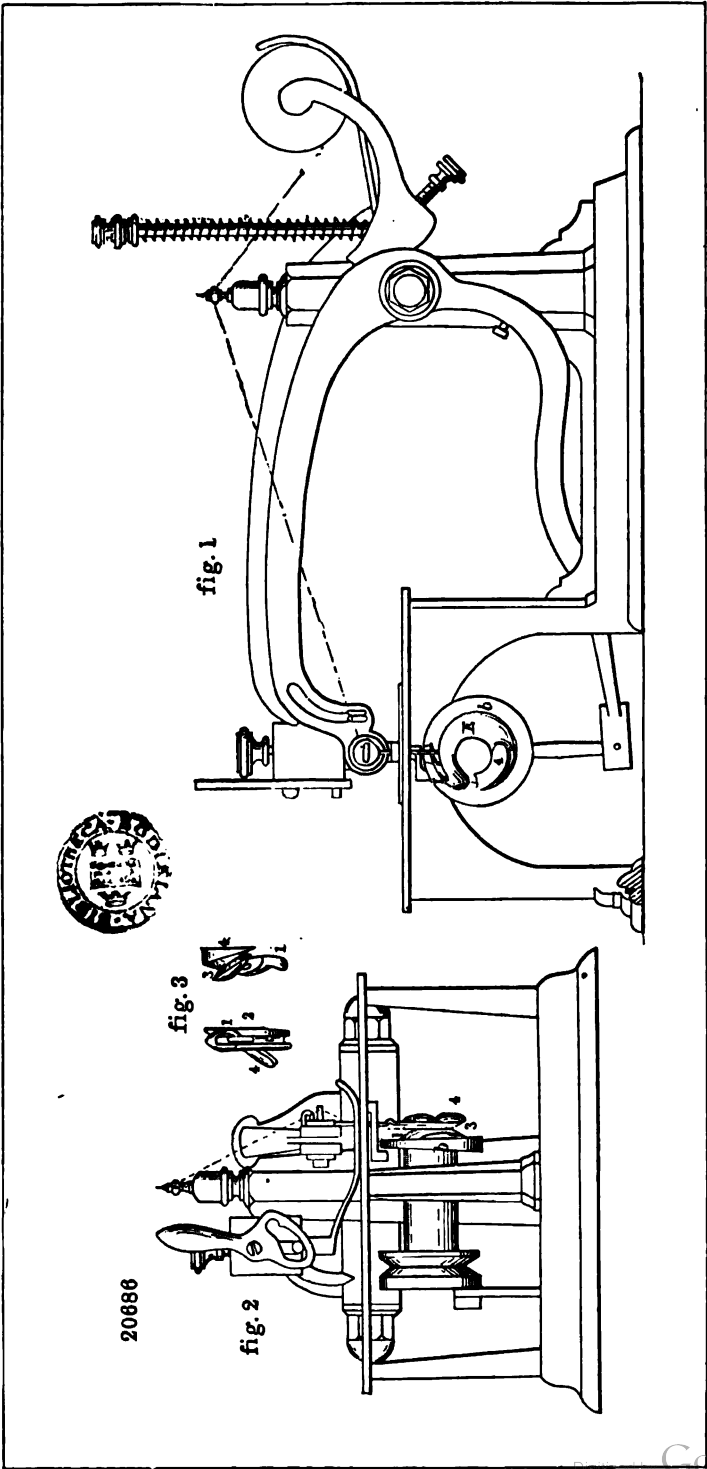


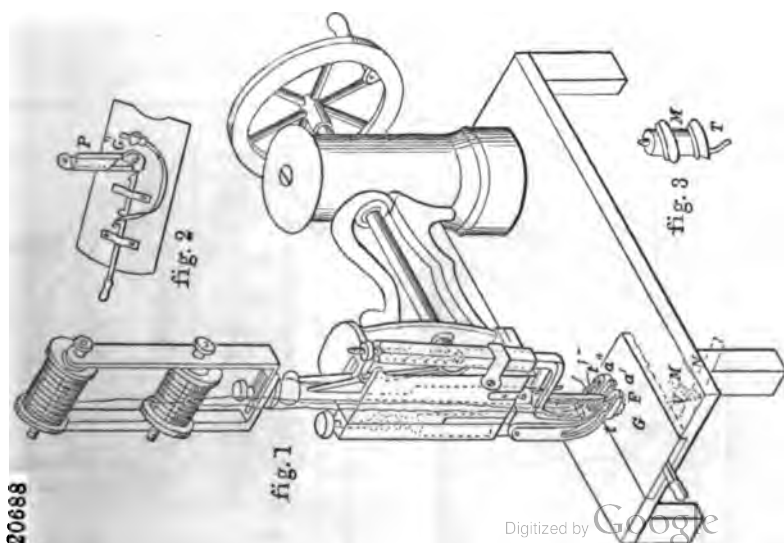
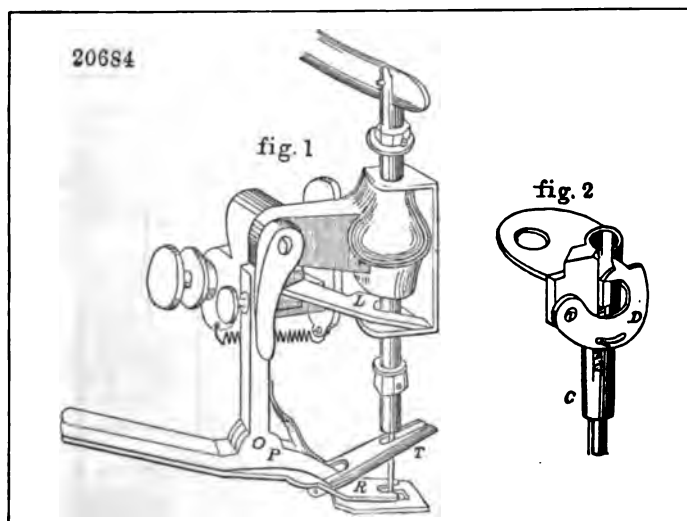
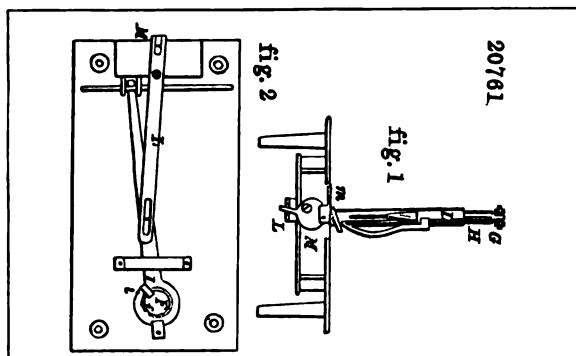
20531

fig. 1

fig. 2







20763

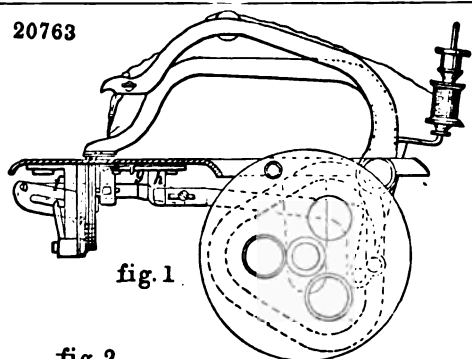
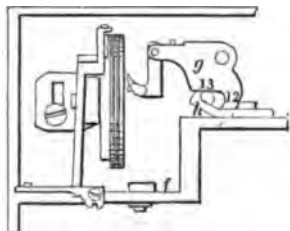
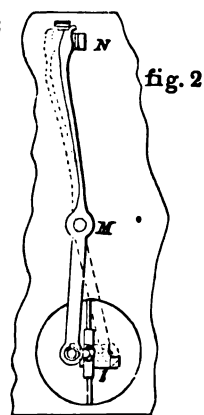
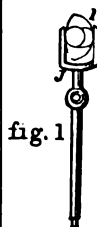


fig. 2



20753



20773

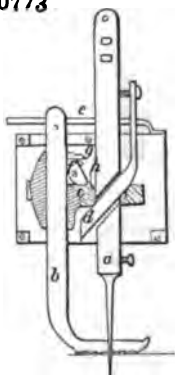
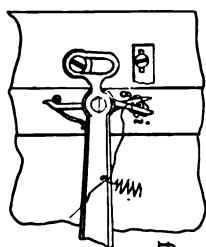
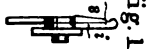


fig. 1

20742



20739

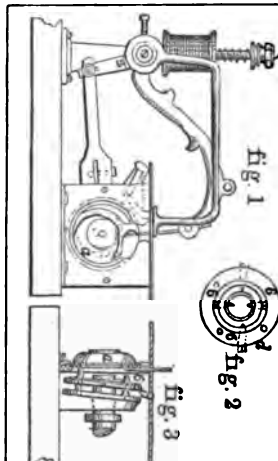
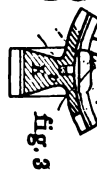
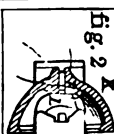
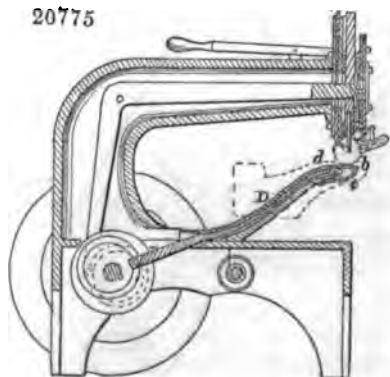
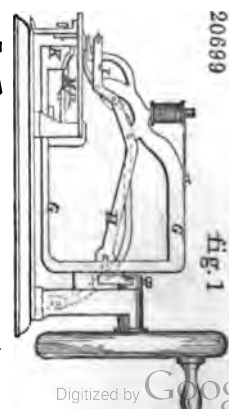


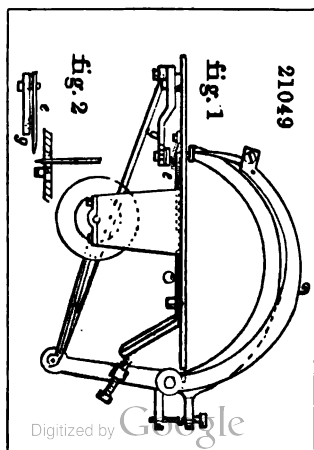
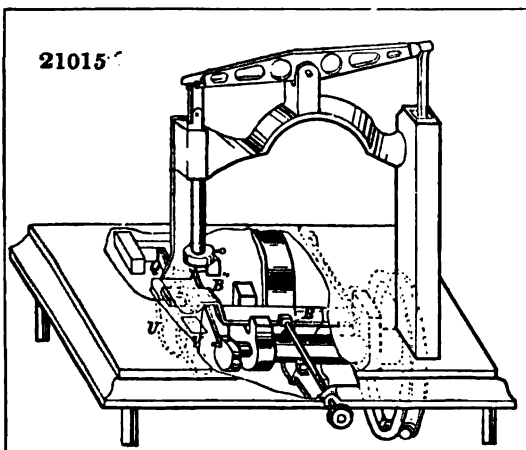
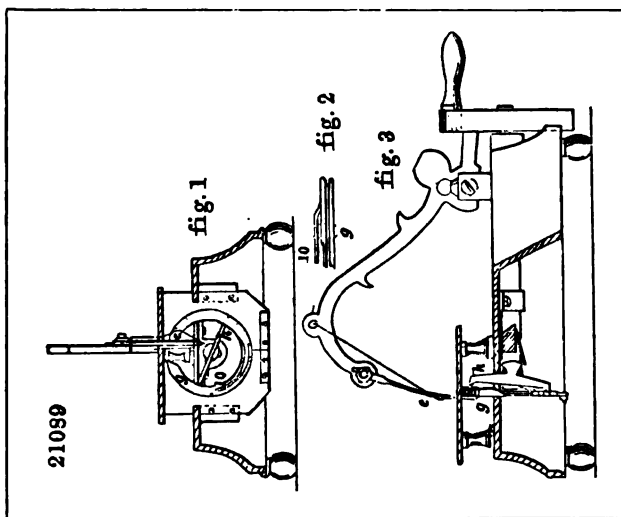
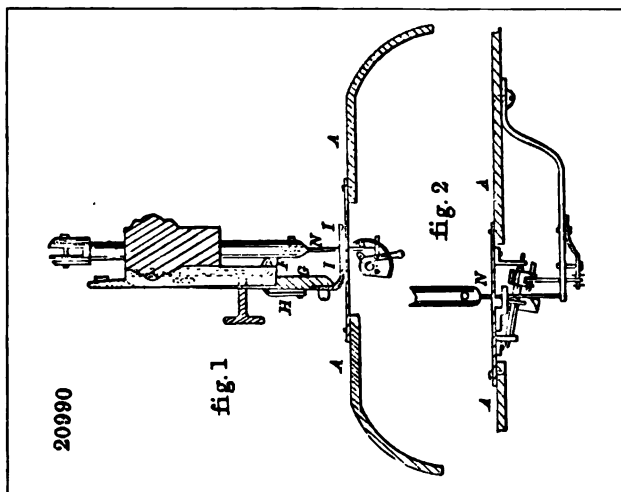
fig. 3

20775



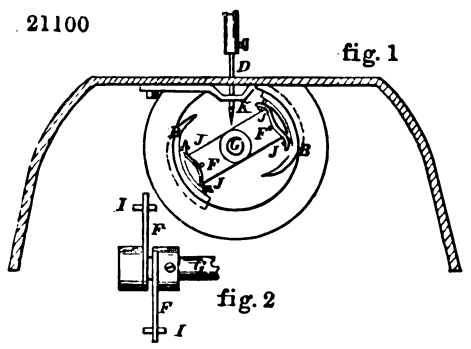
20689



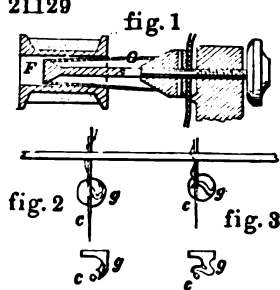




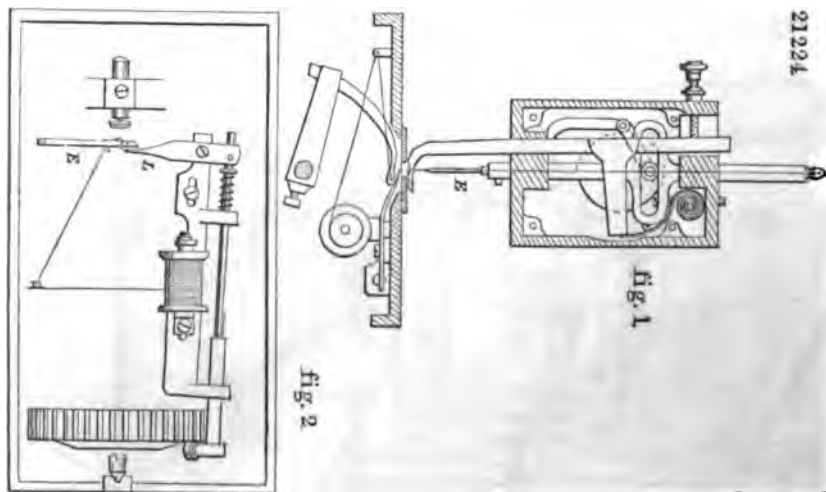
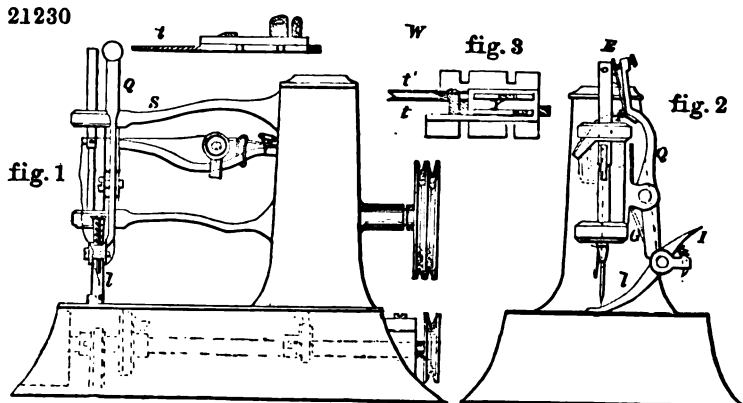
21100



21129

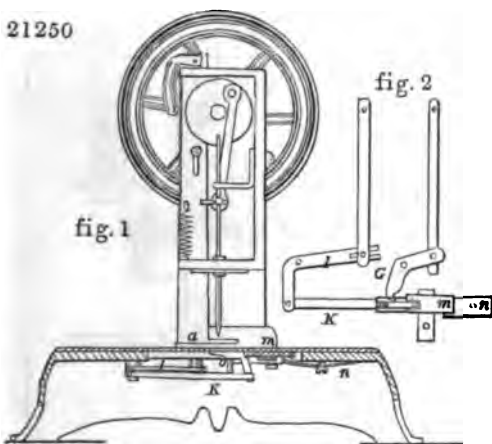


21230



21224

21250



21310

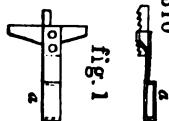


fig. 1



fig. 2

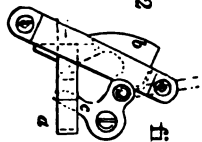


fig. 3

21299

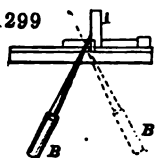


fig. 1

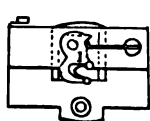


fig. 2

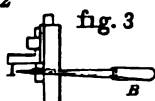


fig. 3

21258

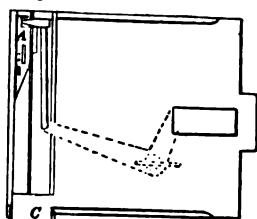


fig. 1

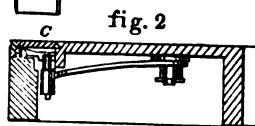
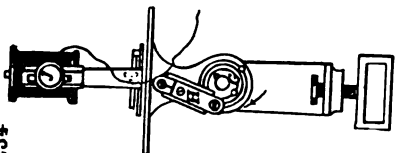


fig. 2

21234



21322

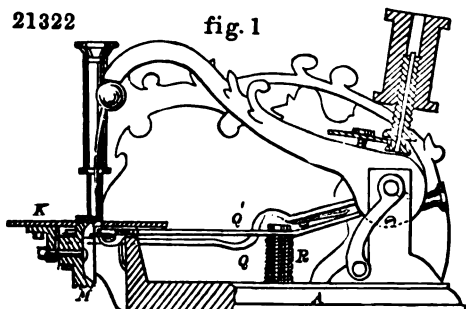
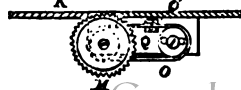
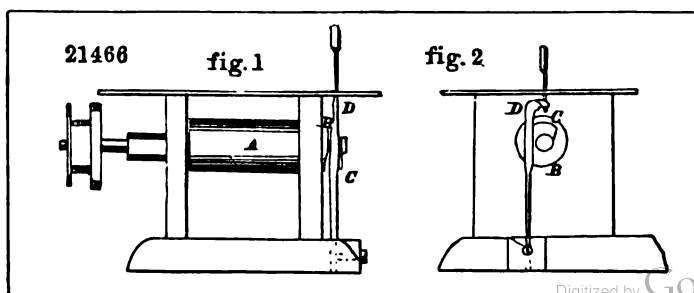
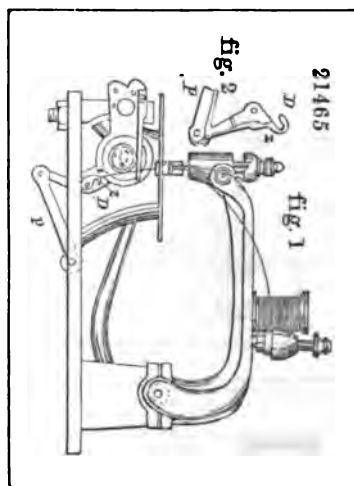
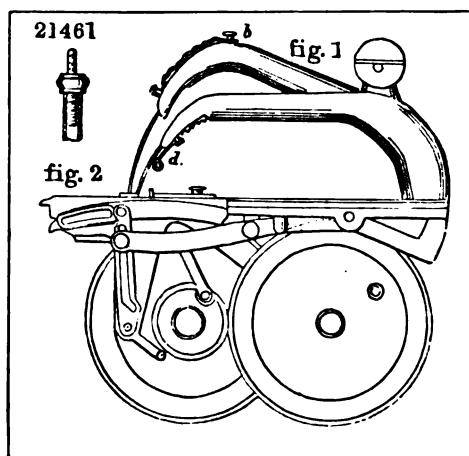
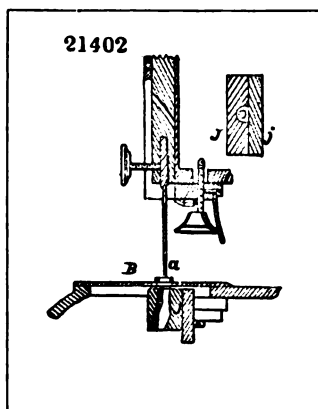
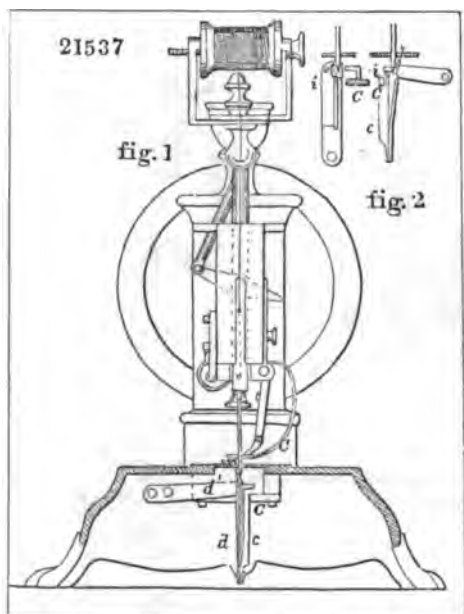


fig. 1

fig. 2





21592

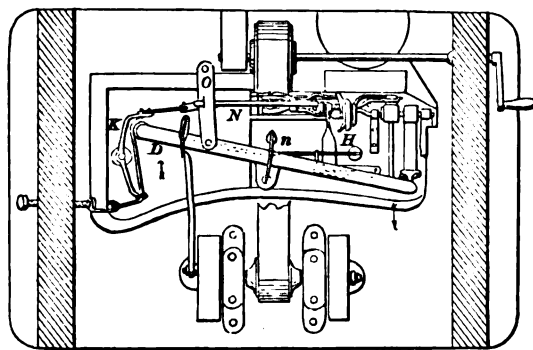


fig. 1

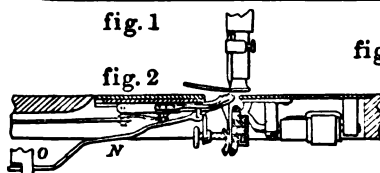


fig. 2

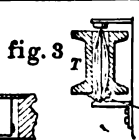


fig. 3

21713

fig. 2

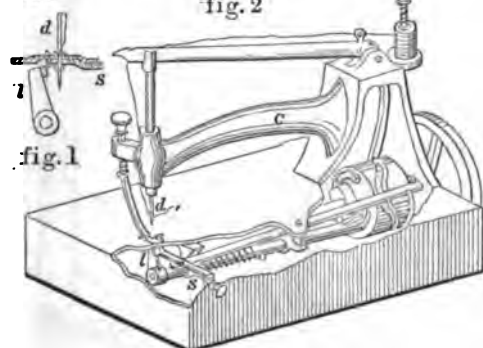
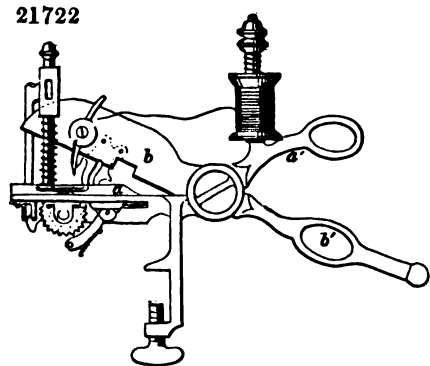


fig. 1



21722



21689

fig. 1

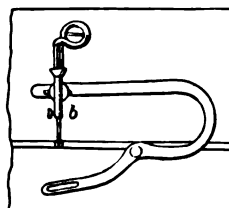
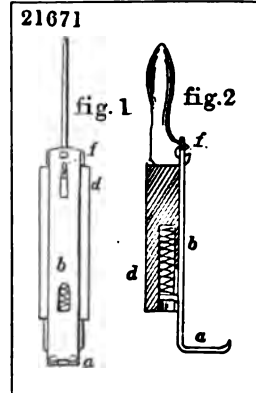
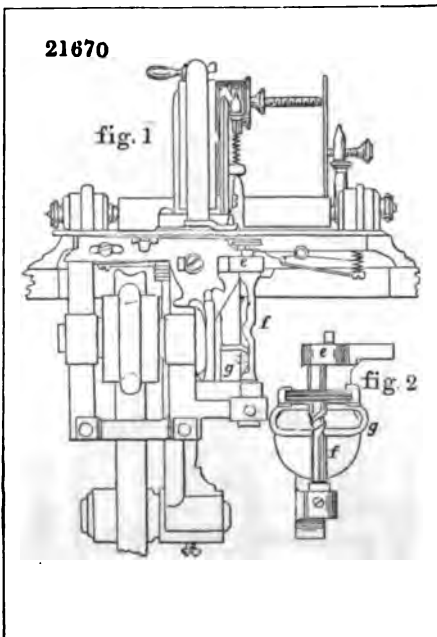
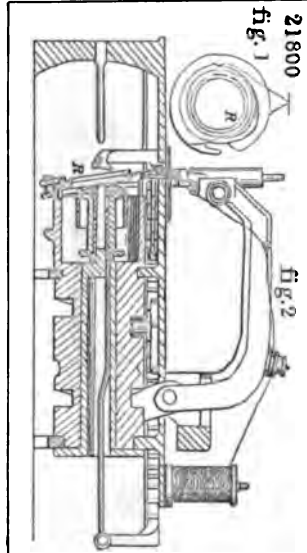
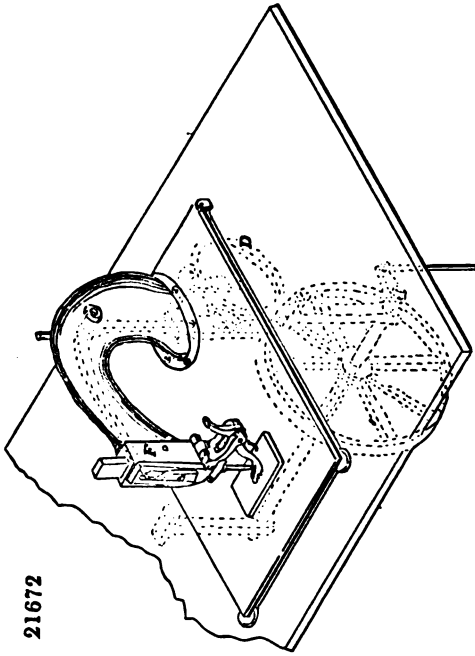
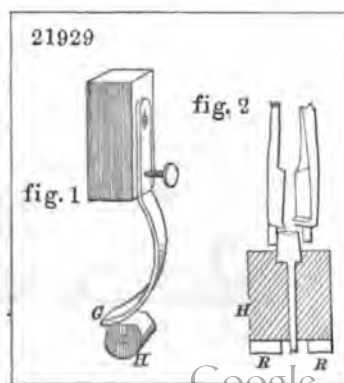
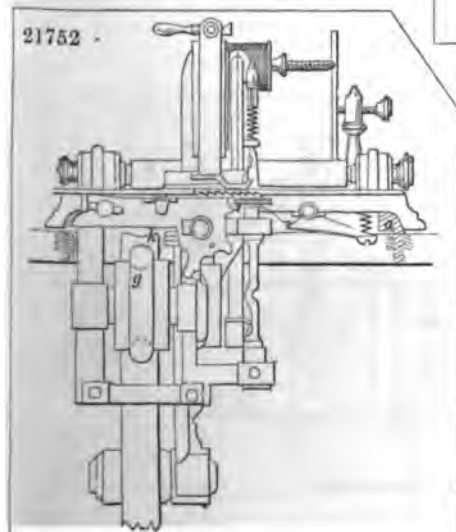
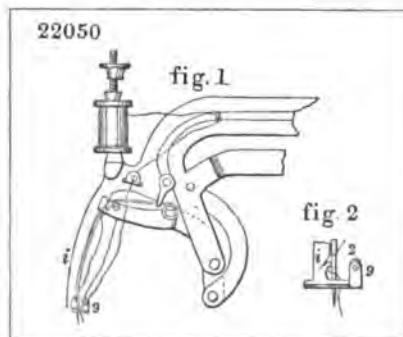
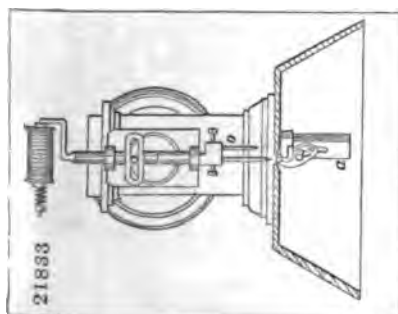
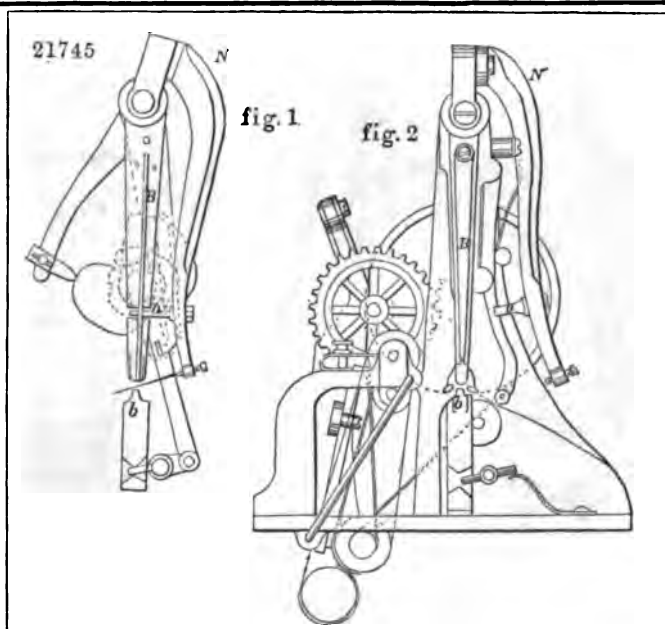


fig. 2

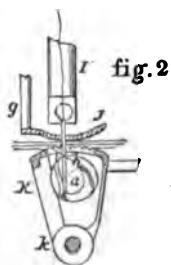
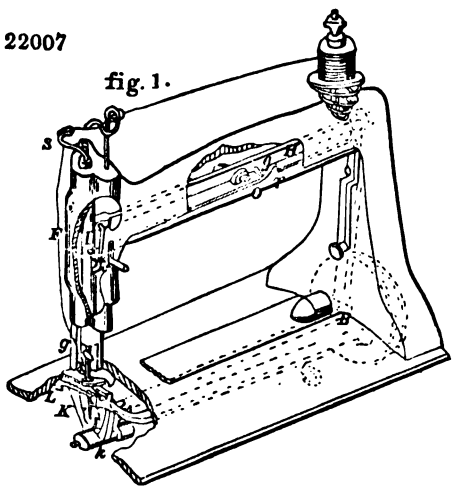






22007

fig. 1.



22137

fig. 1

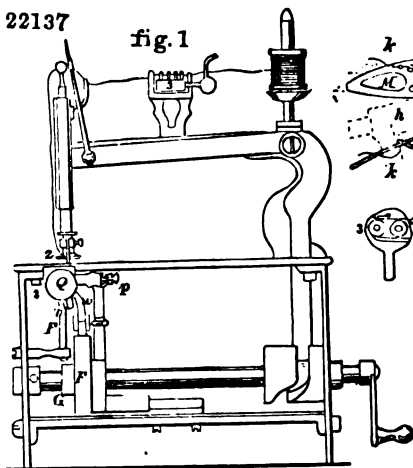


fig. 2

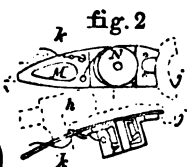


fig. 3



22148

fig. 1

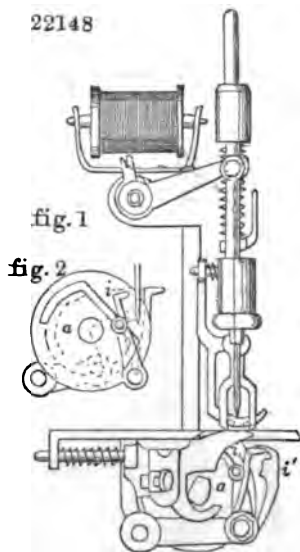
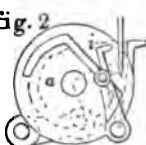


fig. 2



22045

fig 1

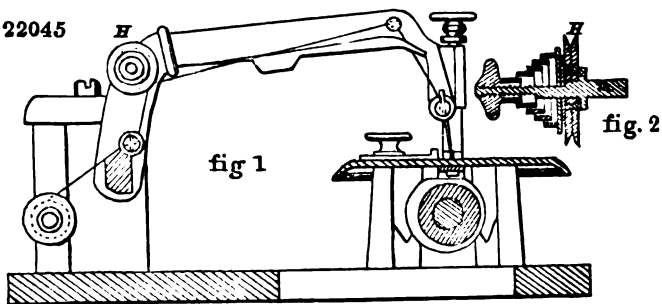
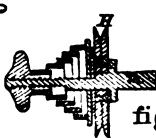
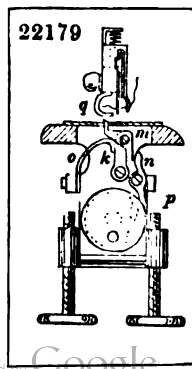
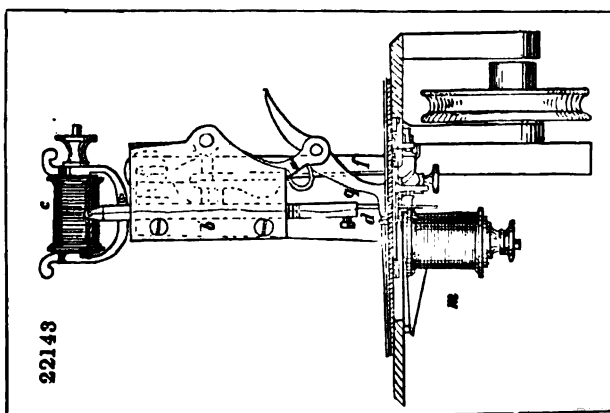
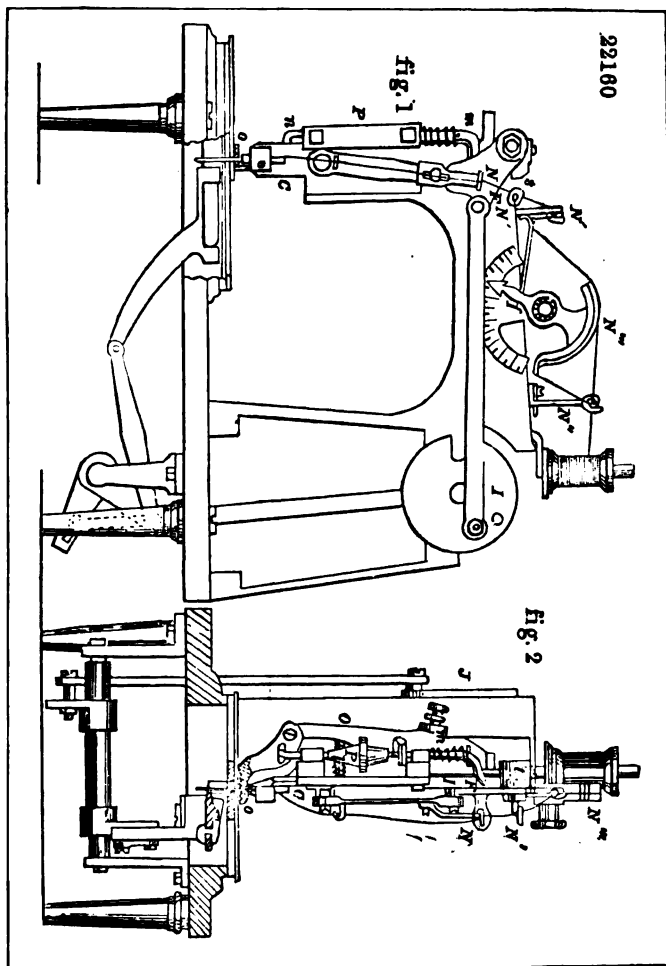


fig. 2







22240

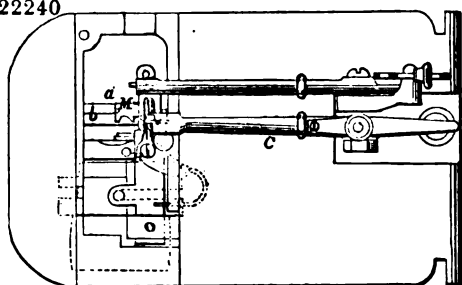


fig. 1.

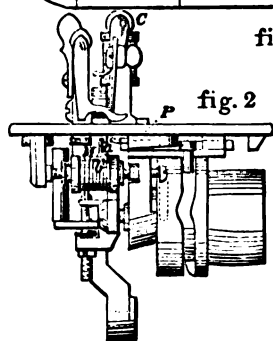


fig. 2

22255

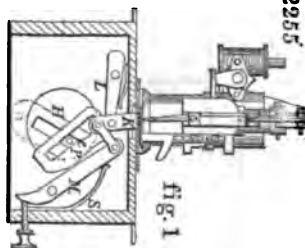


fig. 1

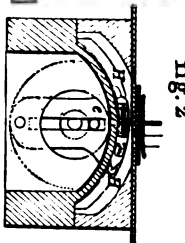
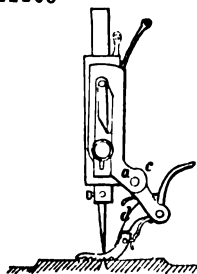
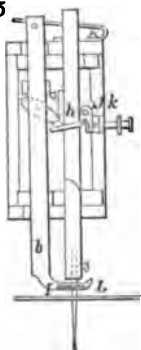


fig. 2

22269



22225

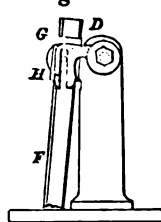


22264



fig. 1

fig. 2



22220

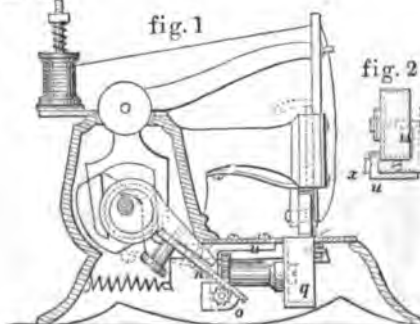
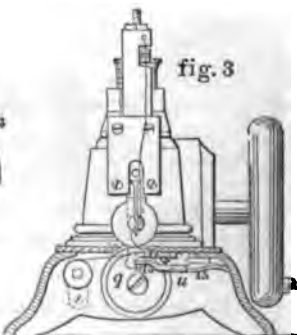


fig. 1

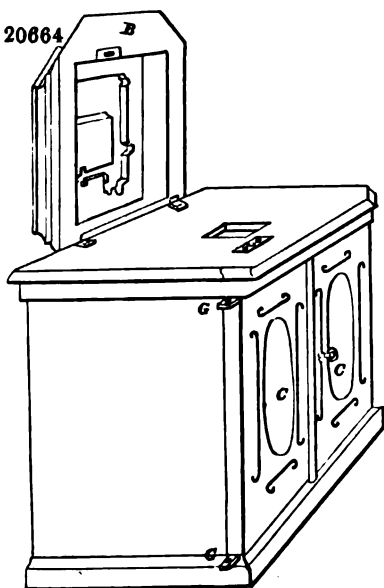
fig. 2



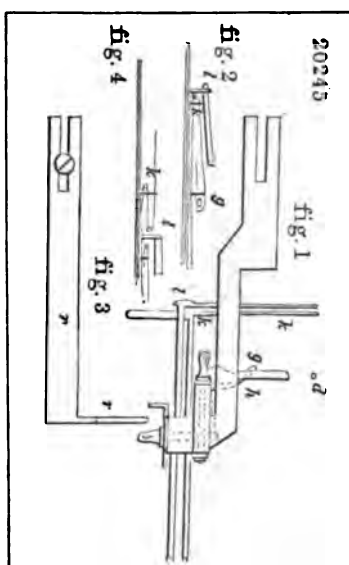
fig. 3



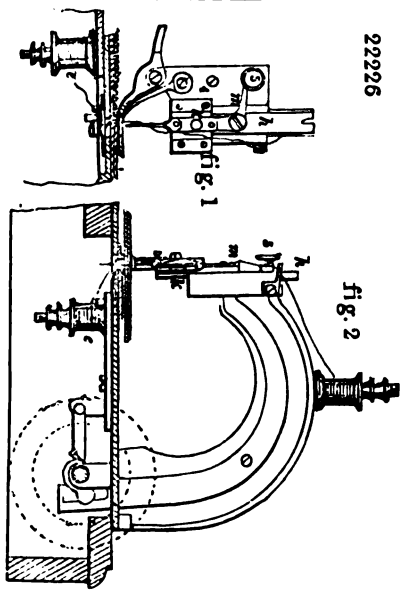
20664



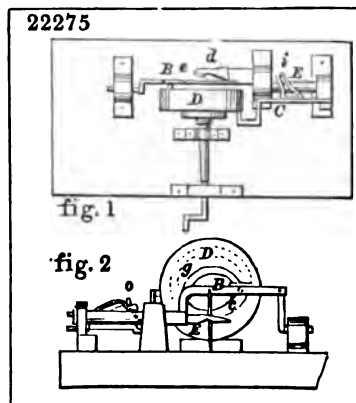
20245



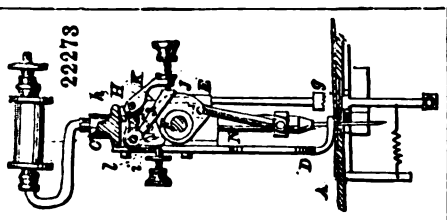
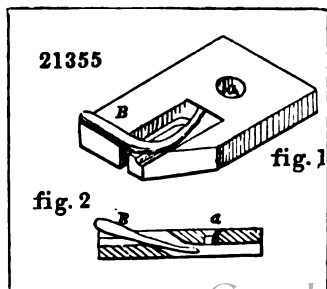
22226



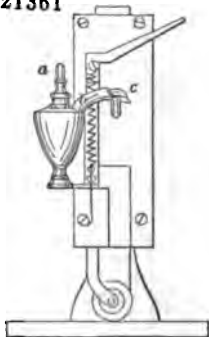
22275



21355



21361



20006

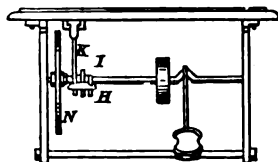


fig. 1

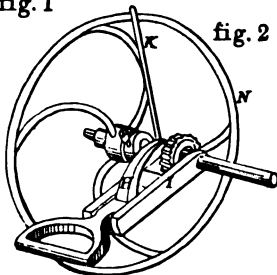
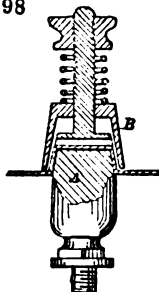


fig. 2

20409



21398



19283

fig. 1

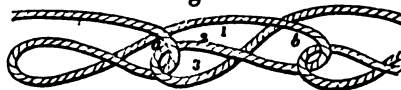


fig. 2



fig. 1

fig. 2

22221

21556

fig. 2

fig. 1

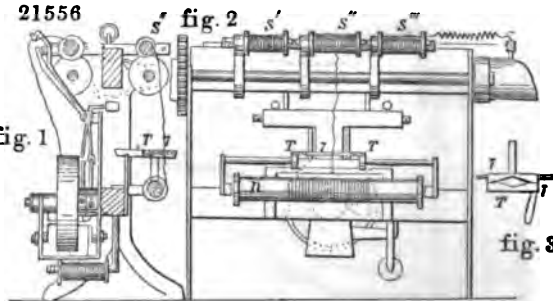


fig. 3

21068

fig. 1

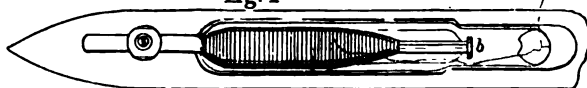


fig. 2



19161

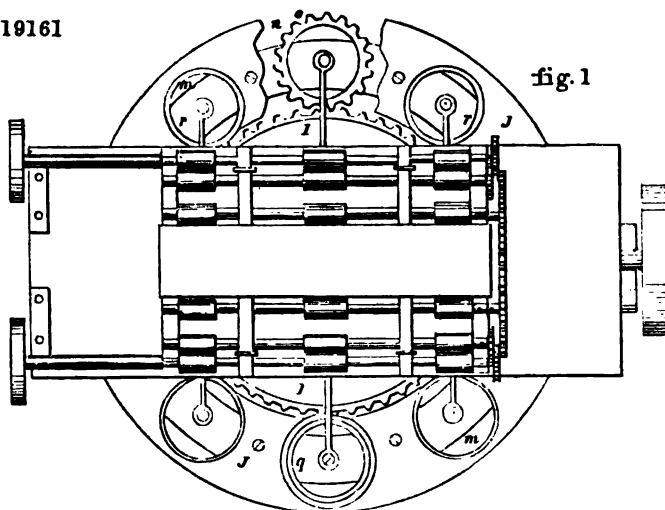


fig. 1

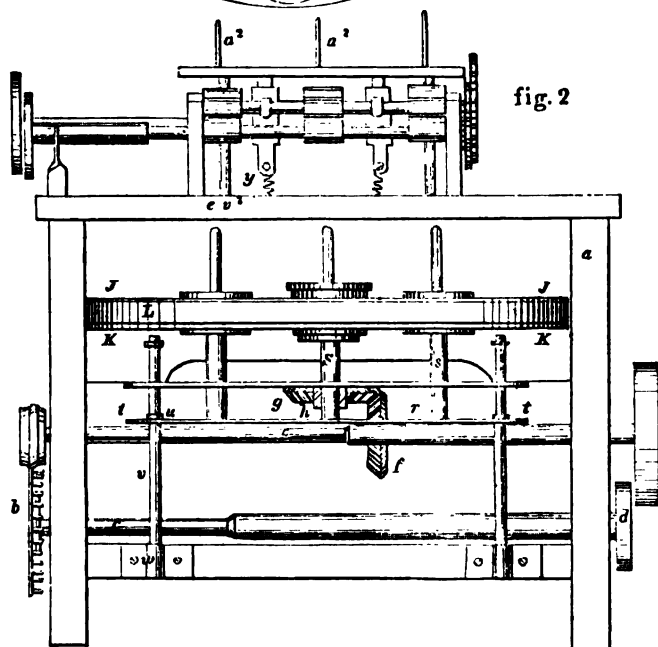
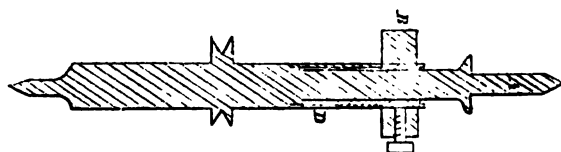
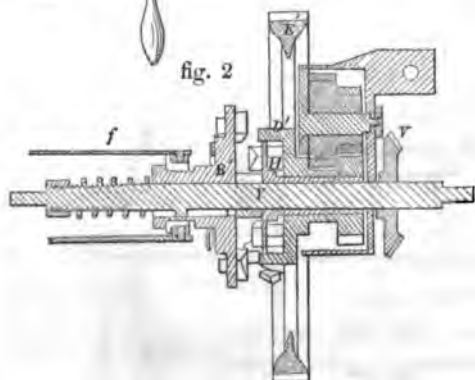
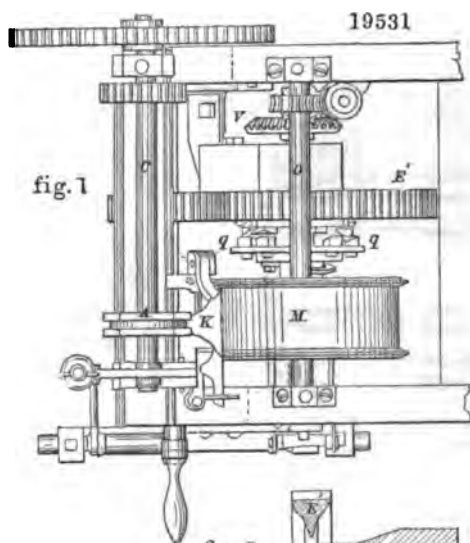


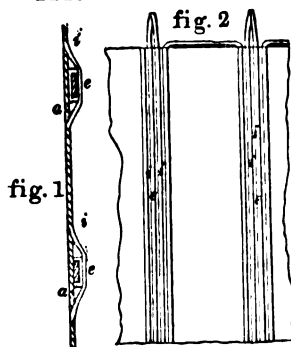
fig. 2



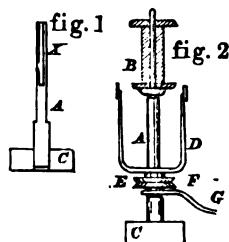
20920



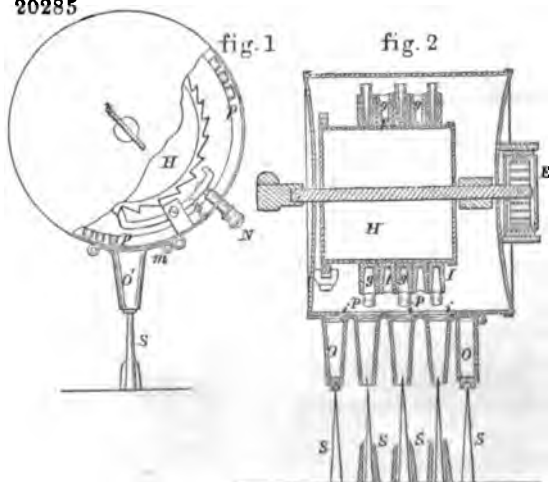
21481



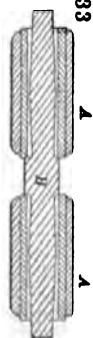
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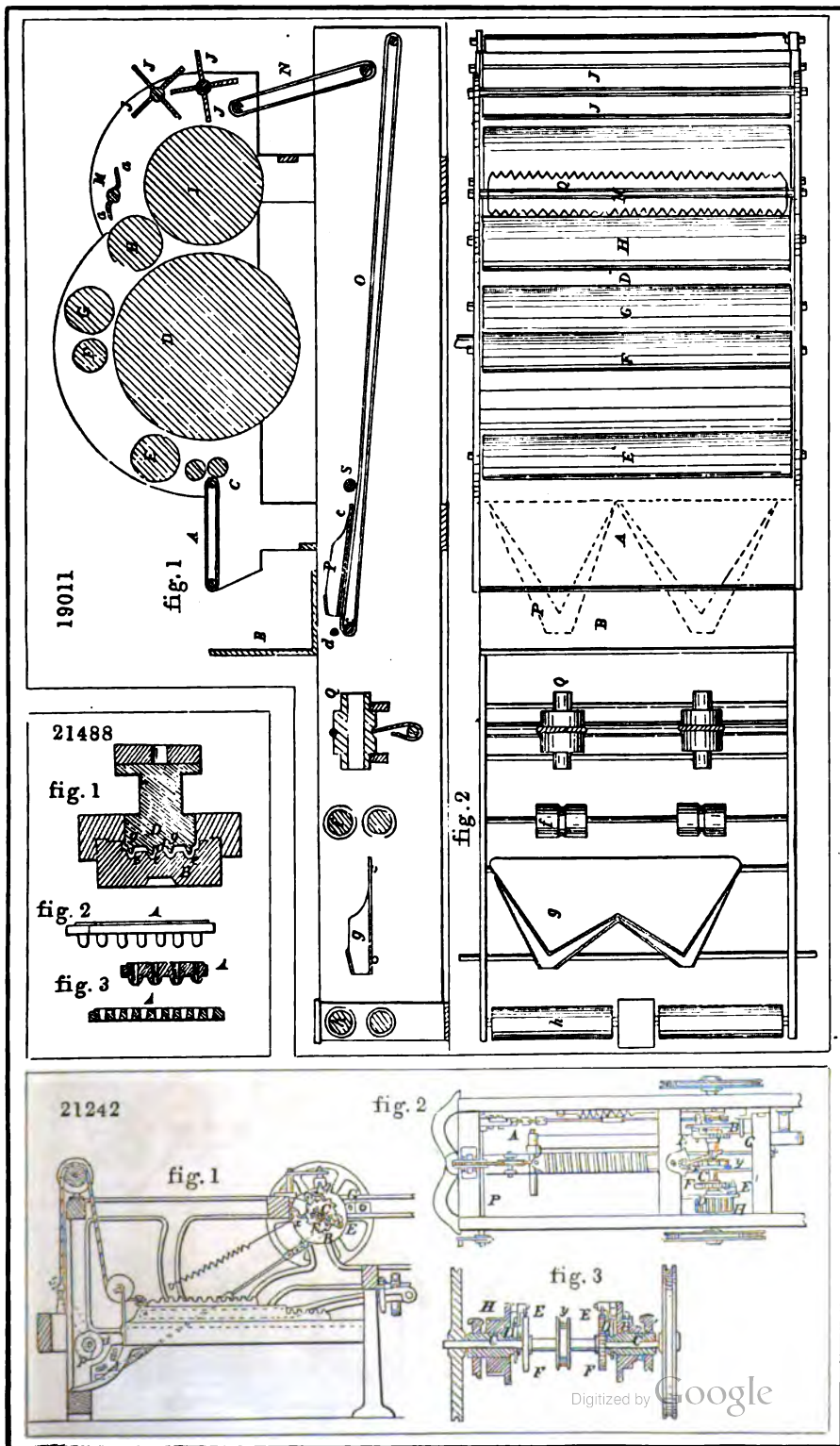


20285

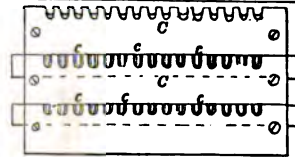
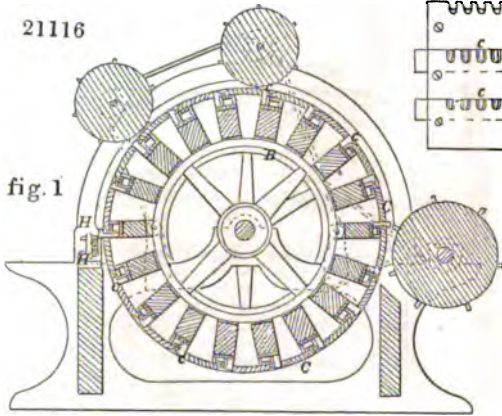


21383

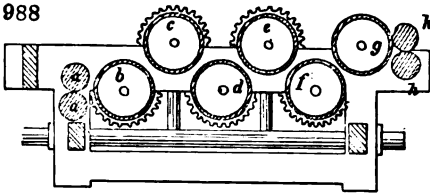




21116



21988



21538

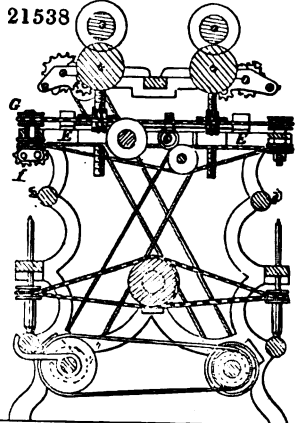
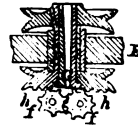


fig. 2

fig. 1



21487

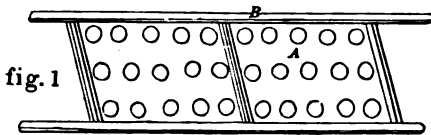
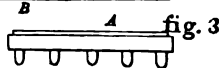
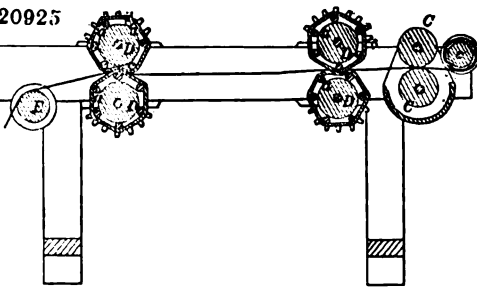


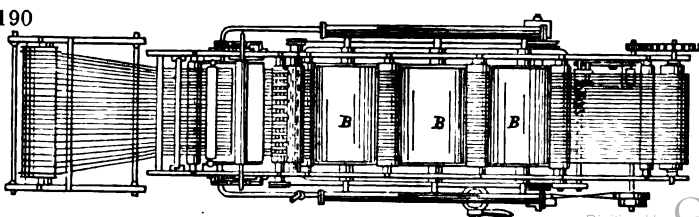
fig. 2



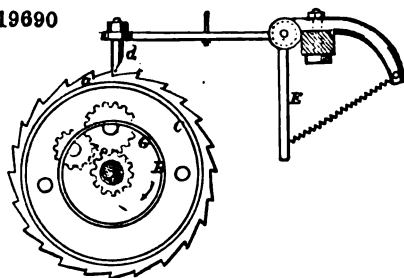
20925



20190

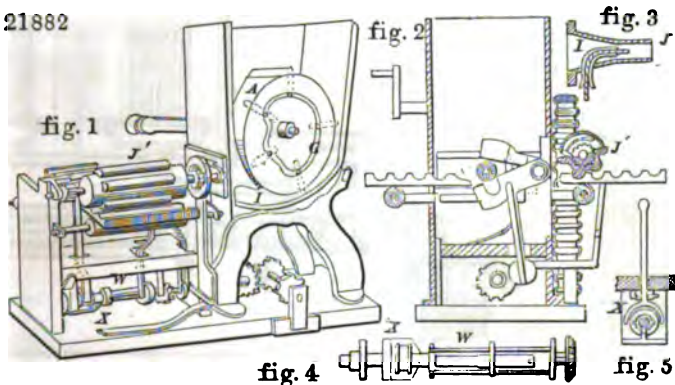


19690

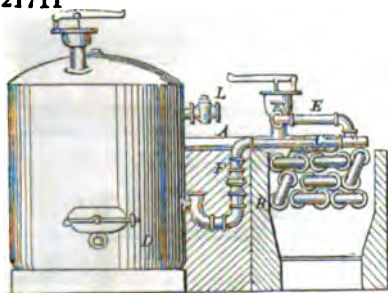


IV.—CHEMICAL PROCESSES.

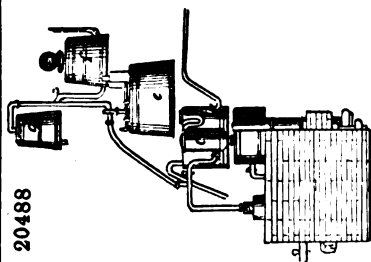
21882



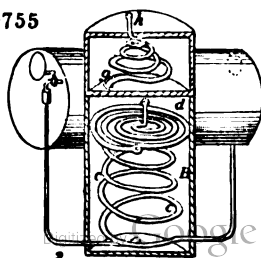
21711



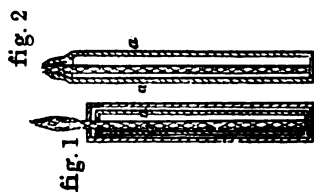
20488



20755

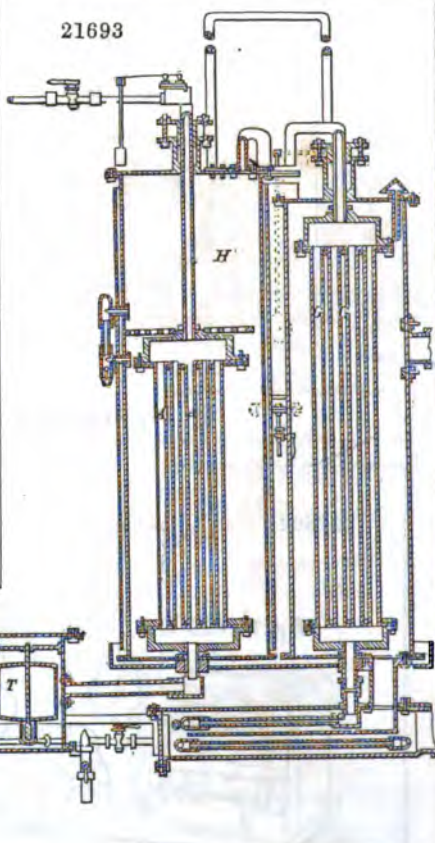


21708





21693



21697

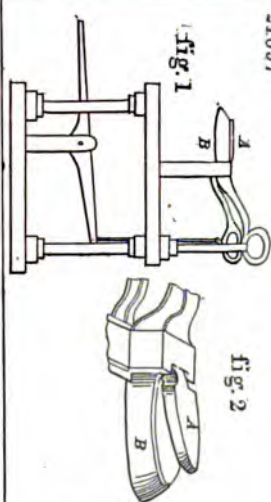
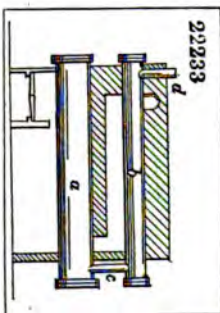
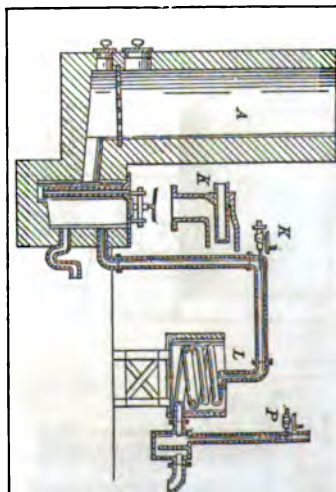


fig. 2

22283



22407



21033

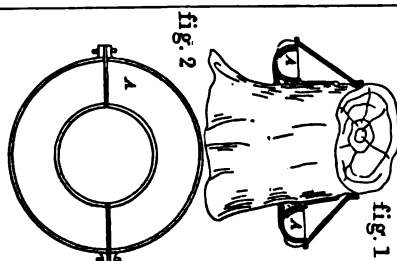


fig. 1

fig. 2

20047

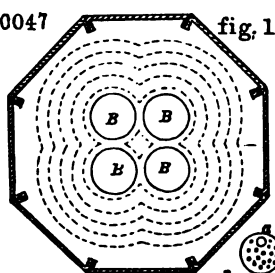


fig. 1



fig. 2

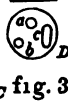
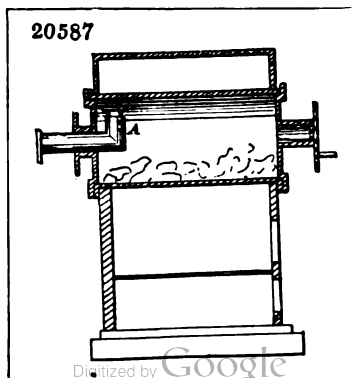
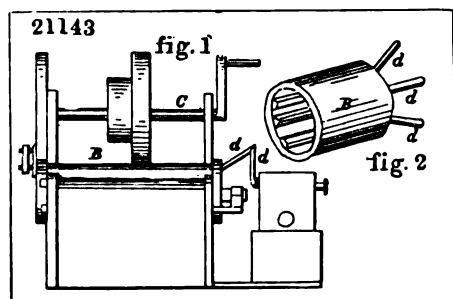
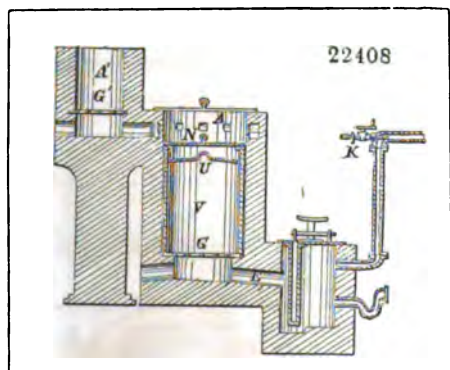
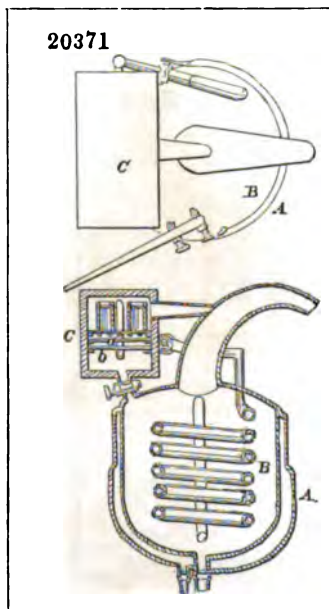
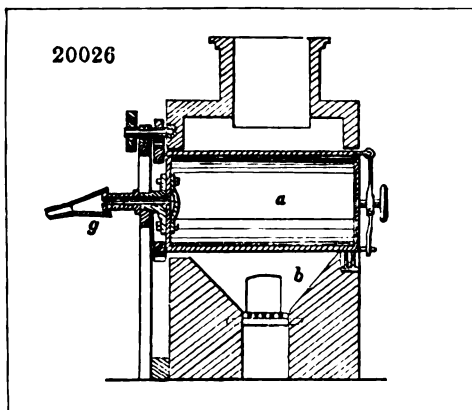
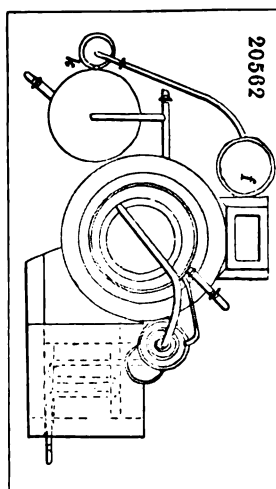
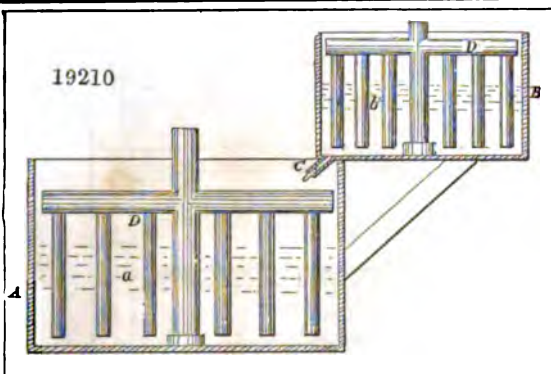


fig. 3



19184

fig. 1

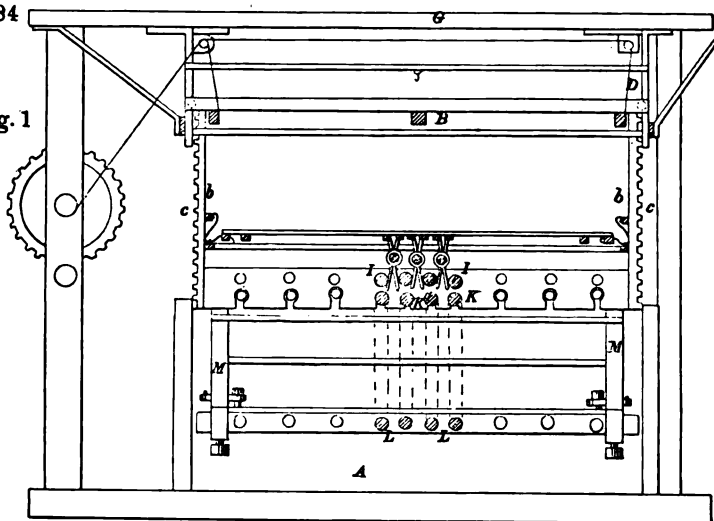
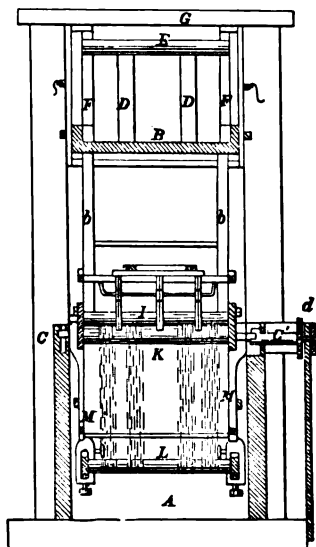
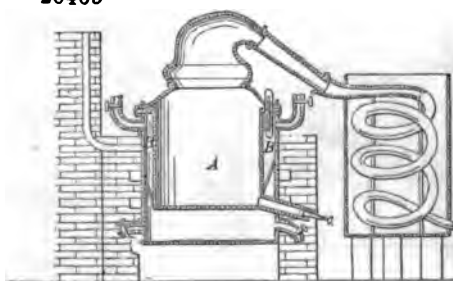
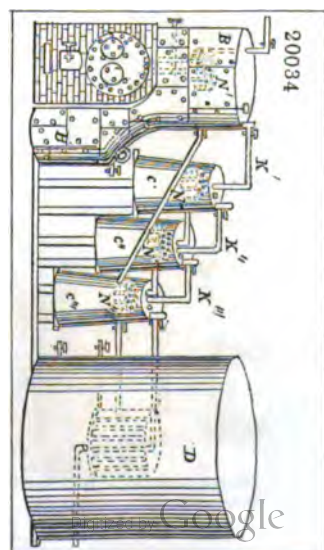
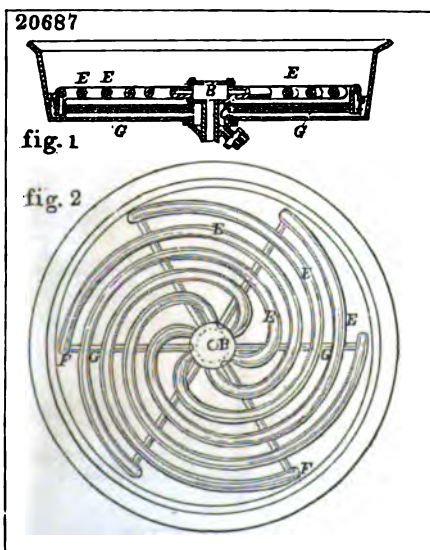
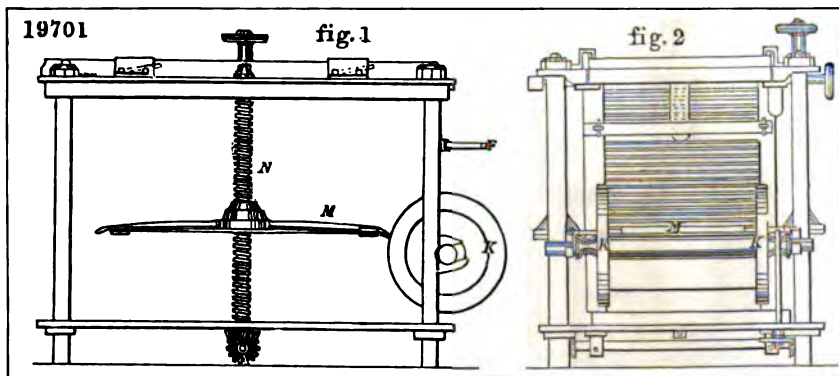
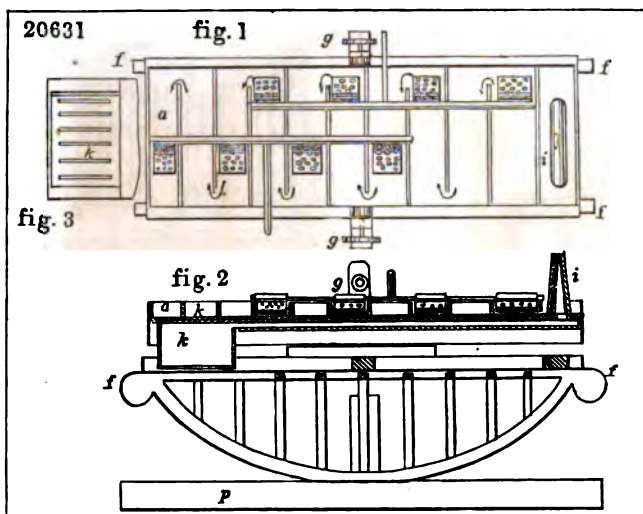


fig. 2

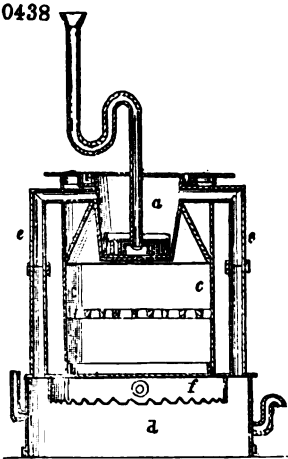


20465

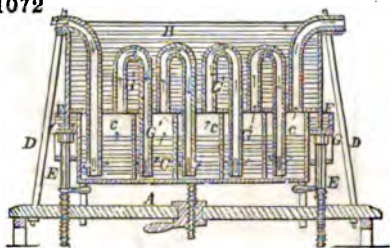




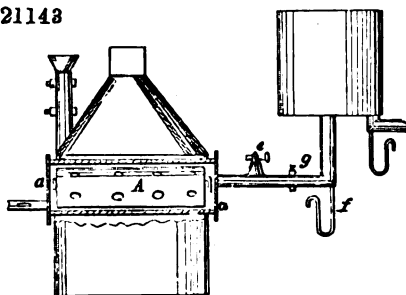
20438



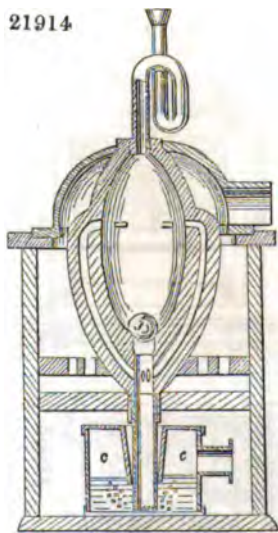
21072



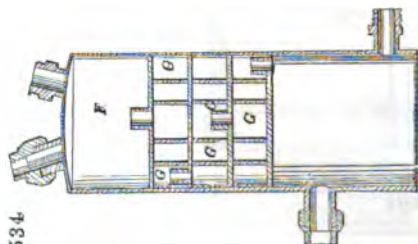
21143



21914



20334



20541

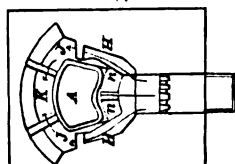
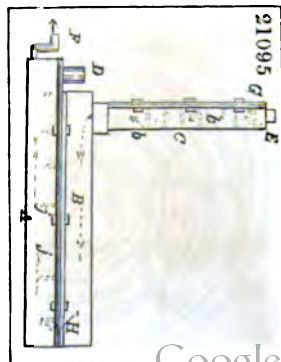
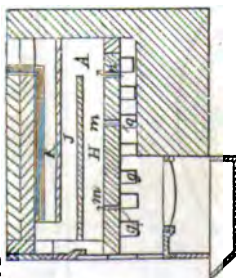


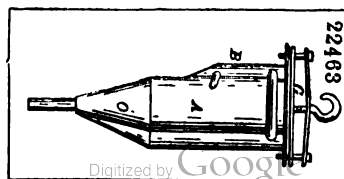
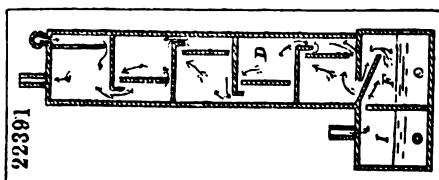
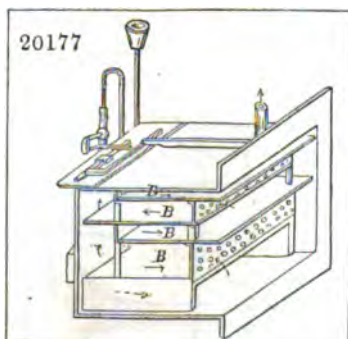
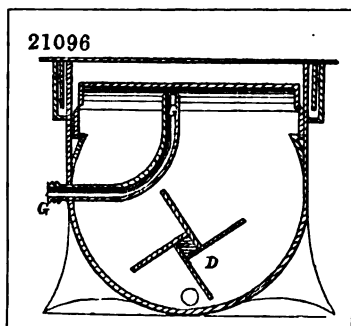
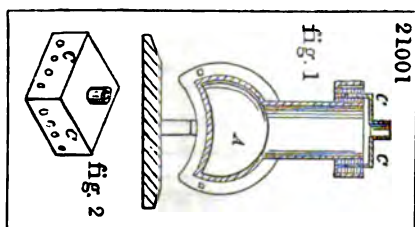
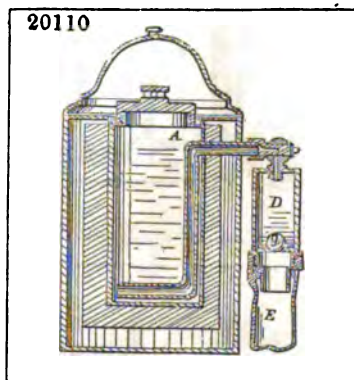
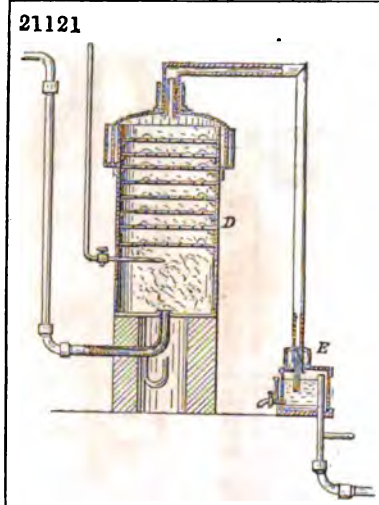
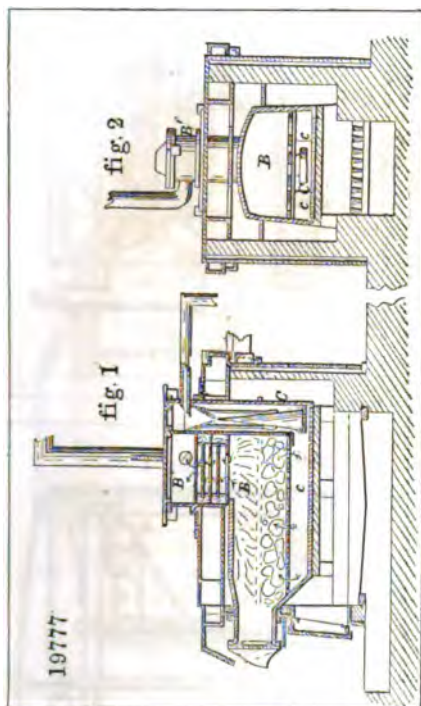
fig. 1

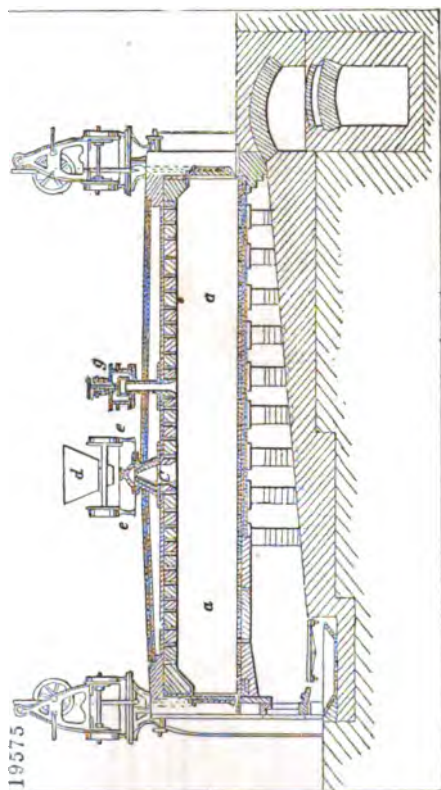
fig. 2



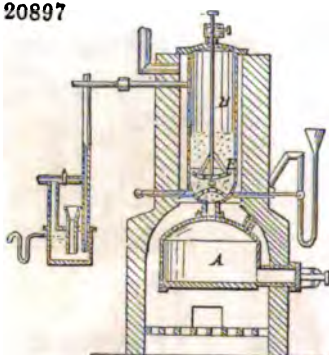
256015





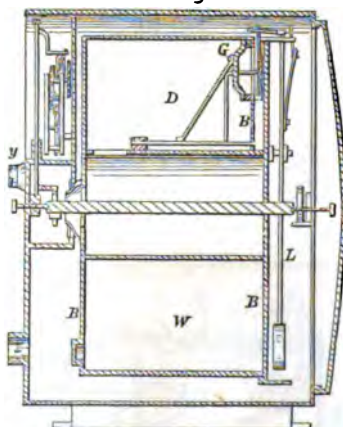


20897



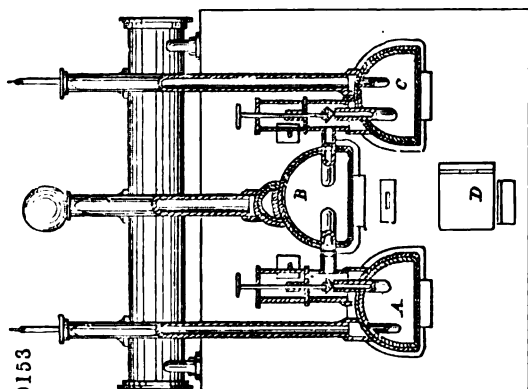
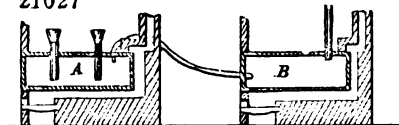
20130

fig. 1

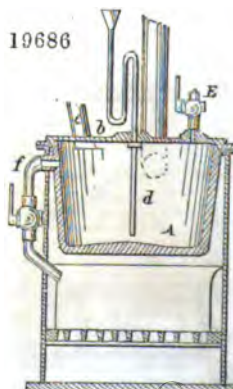


B G D B fig. 2

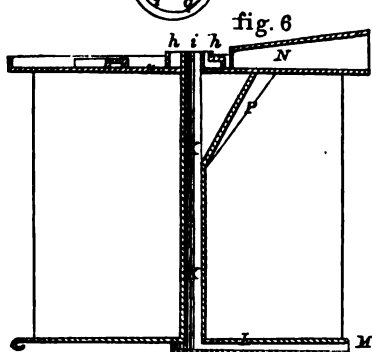
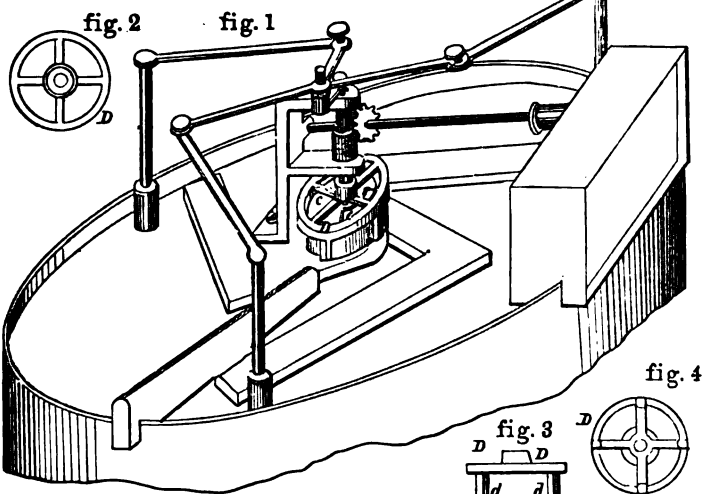
21027



19686



20680



22267

fig. 1

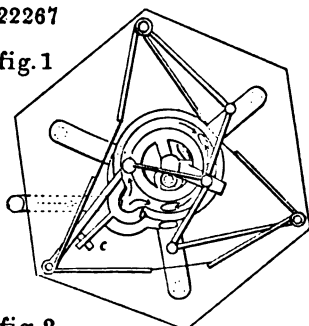
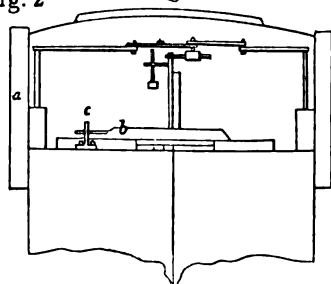


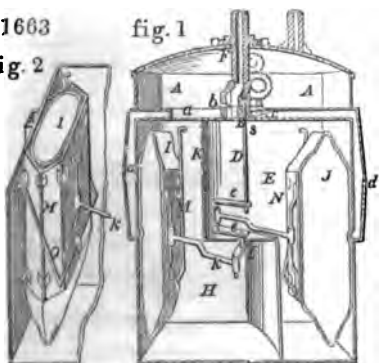
fig. 2



21603

fig. 2

fig. 1





20825

fig. 1

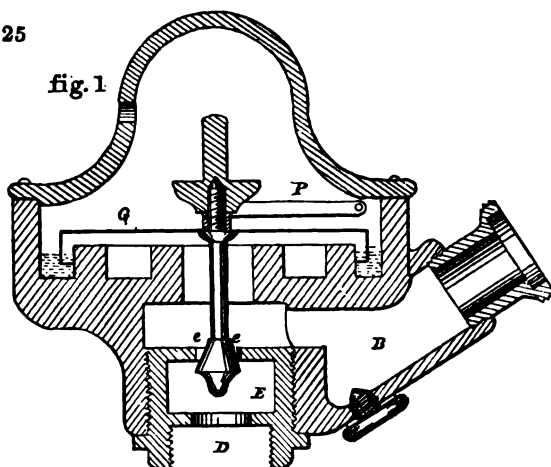
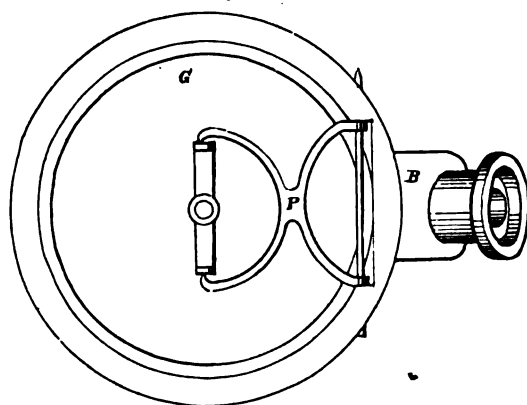
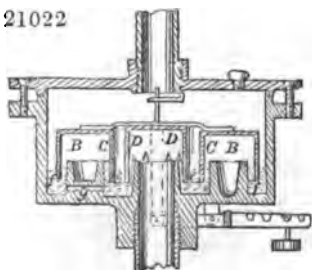


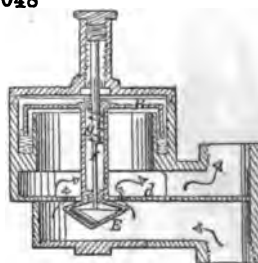
fig. 2



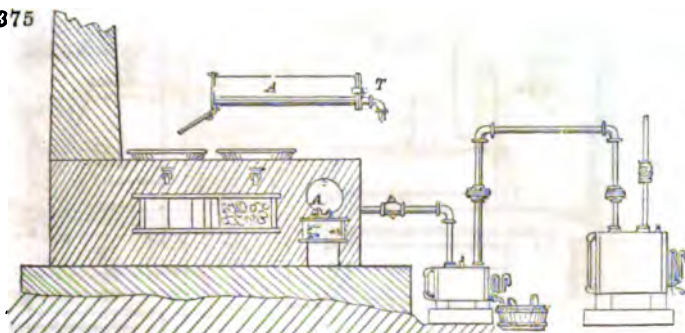
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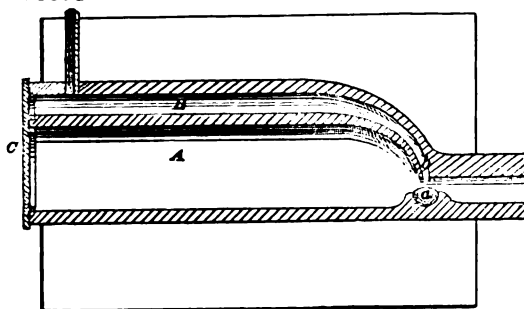
21048



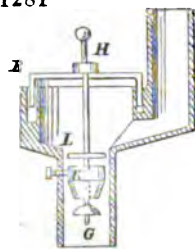
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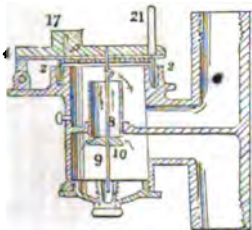
20671



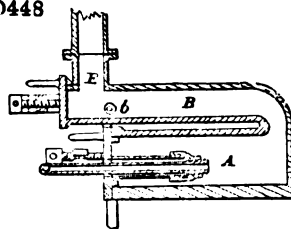
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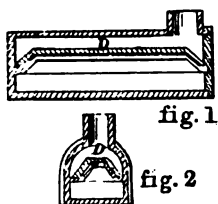
21765



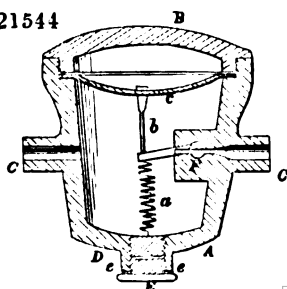
20448



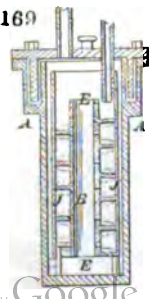
22434



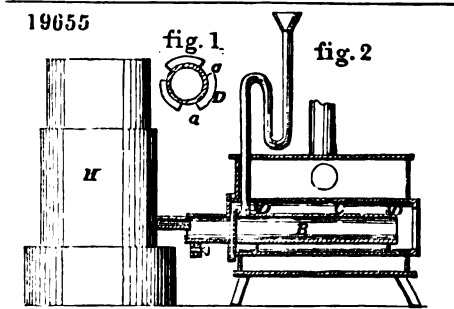
21544



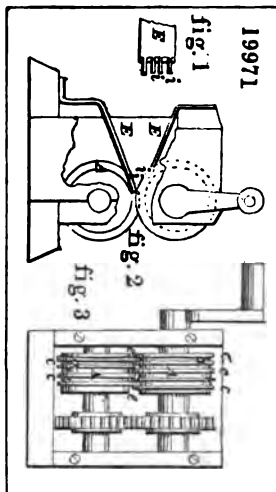
21169



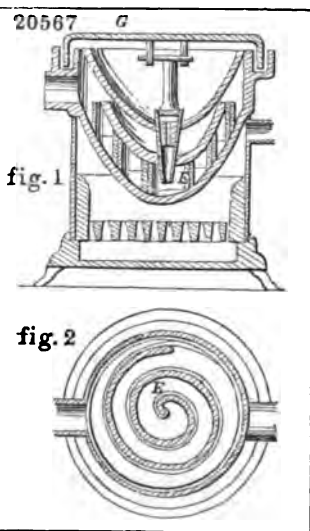
19655



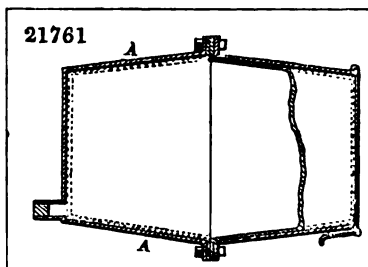
19971



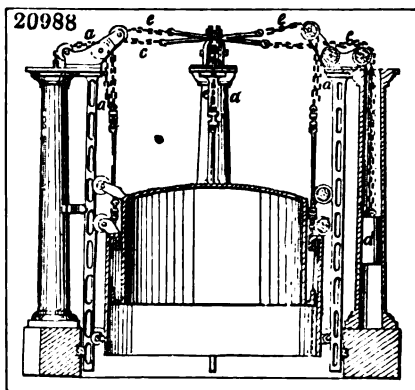
20567



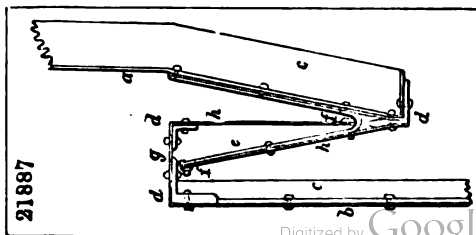
21761



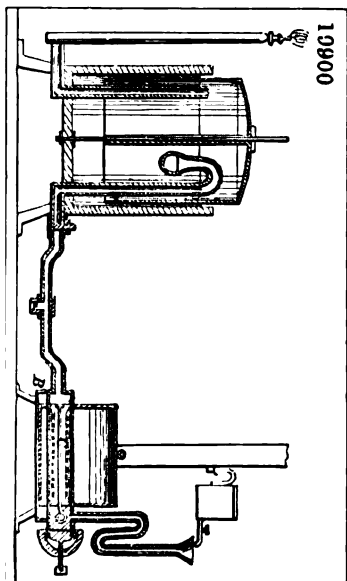
20988

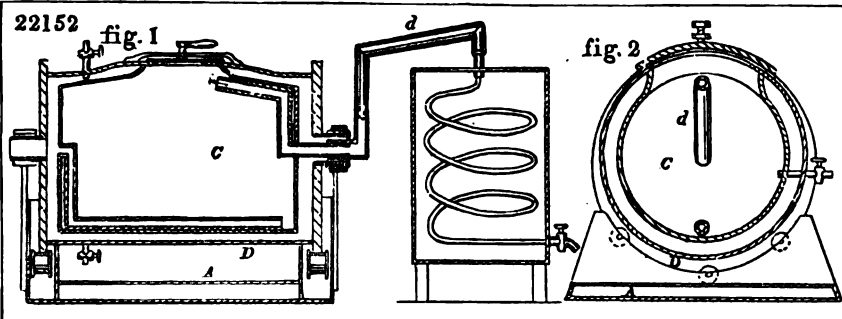


21887



10900

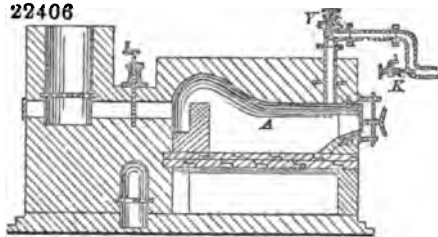




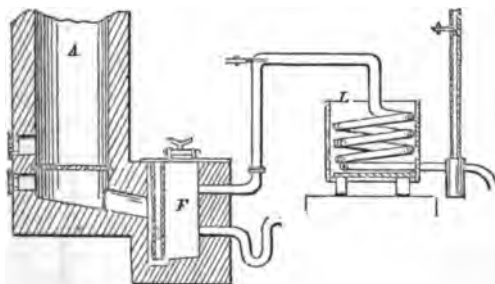
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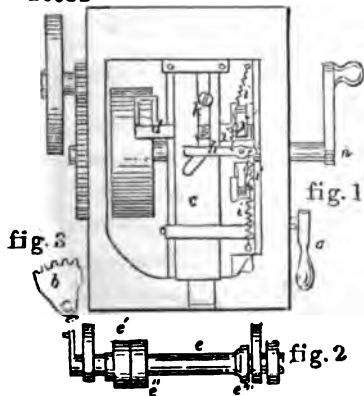
22406



21805

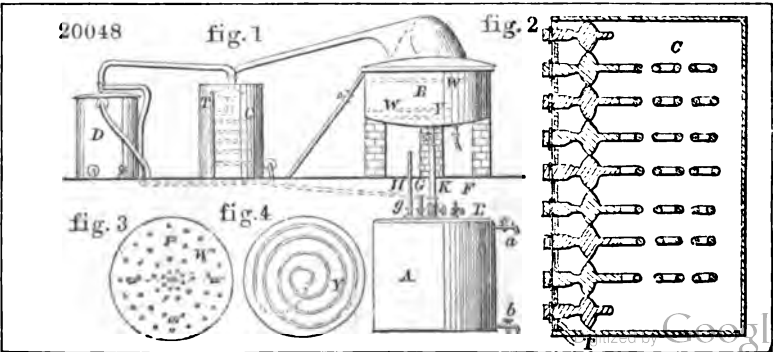
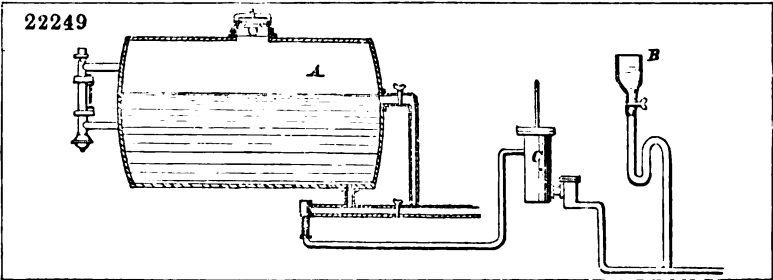
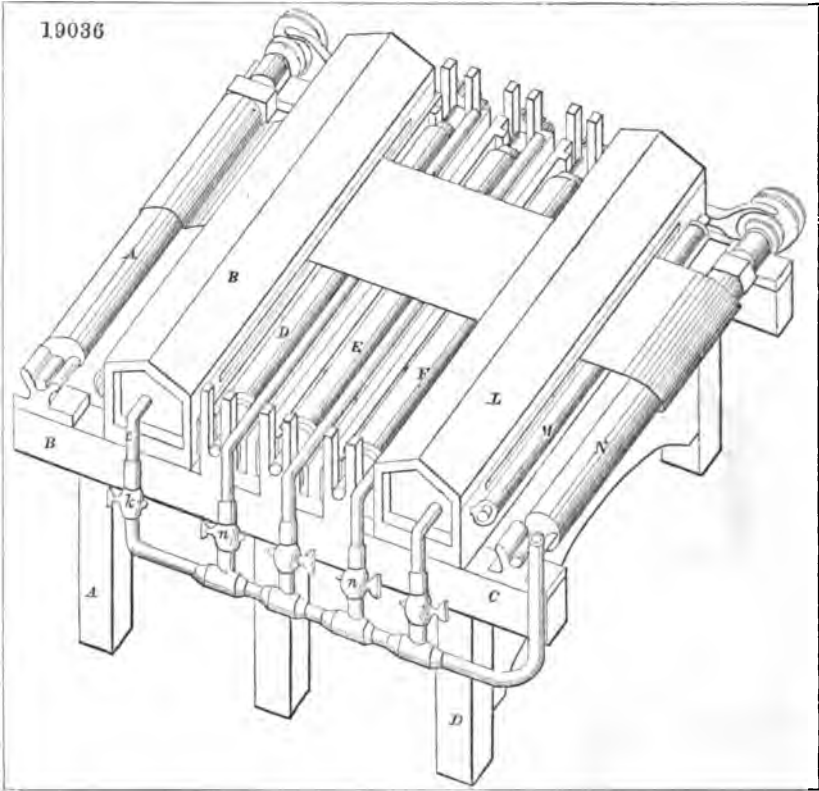


20993

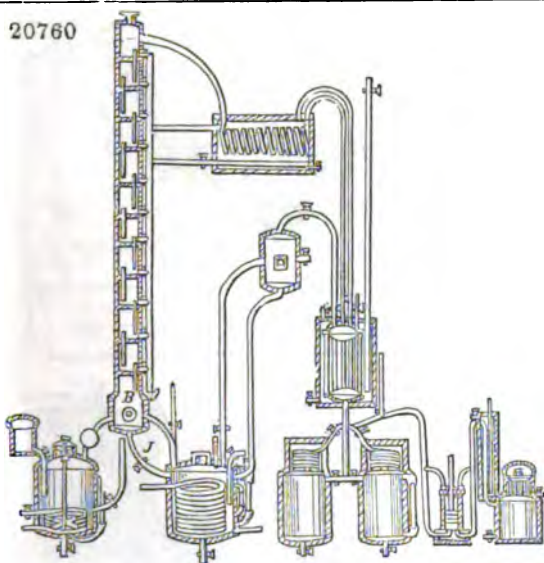


22185





20760



19754

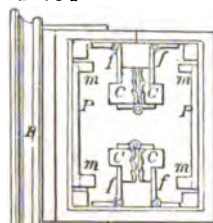


fig. 1

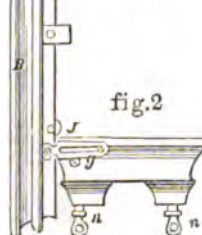
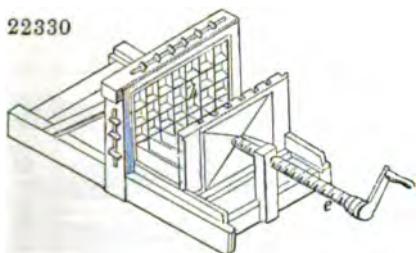
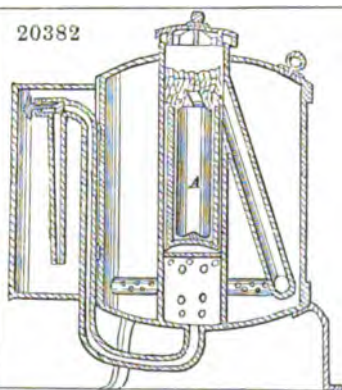


fig. 2

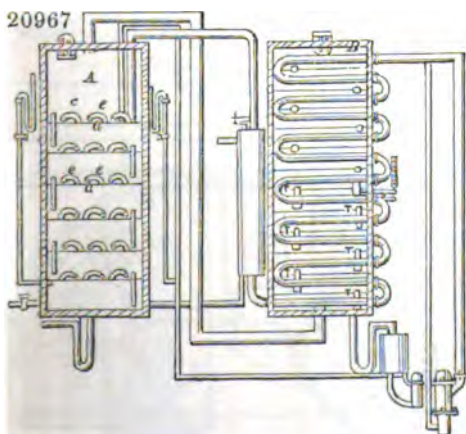
22330



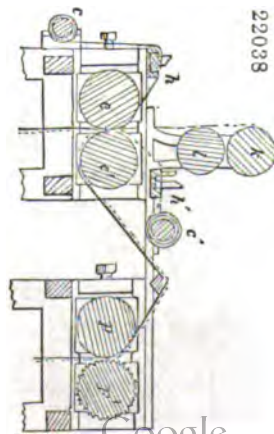
20382

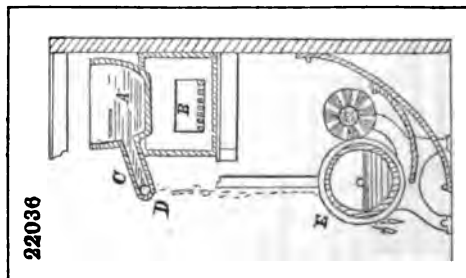
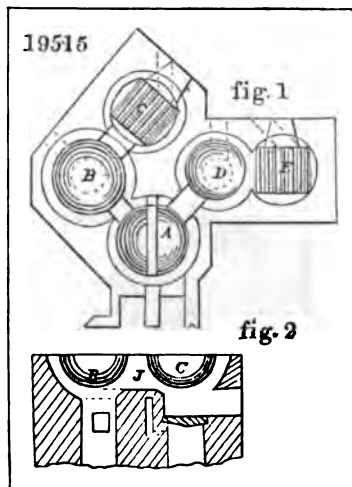
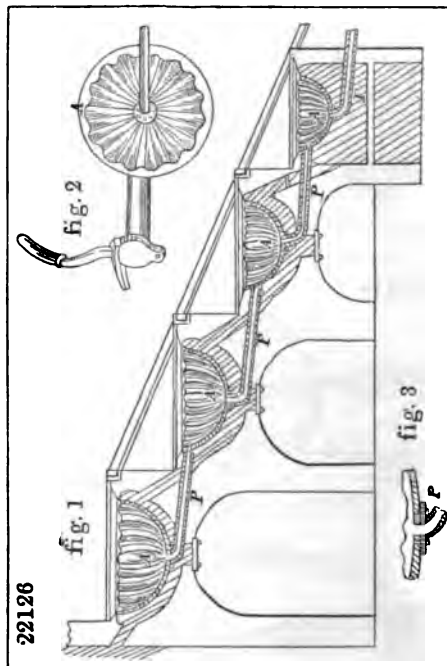
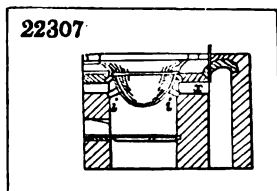
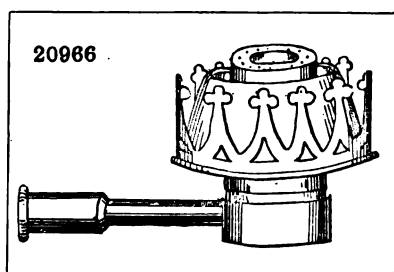
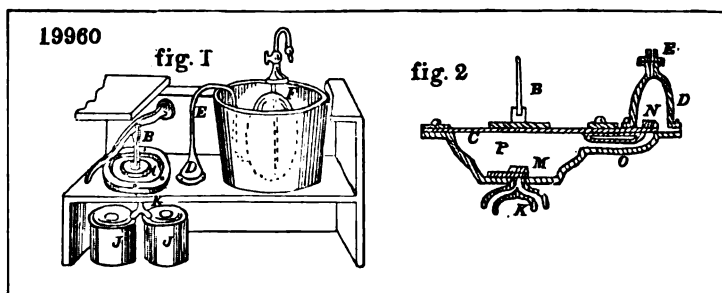


20967

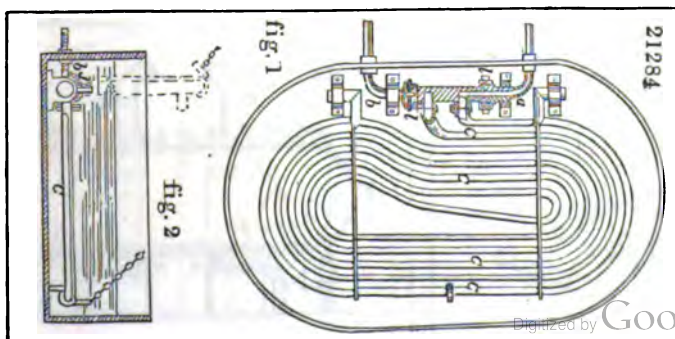
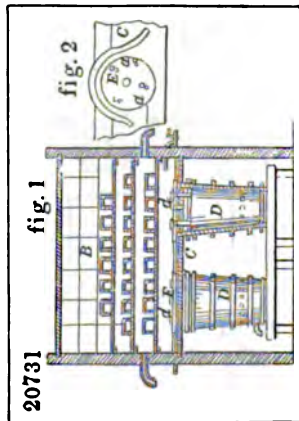
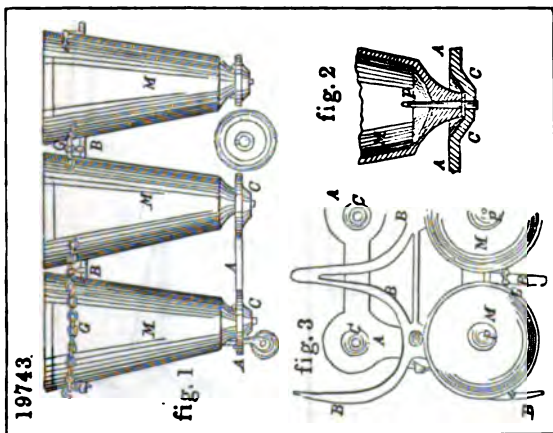
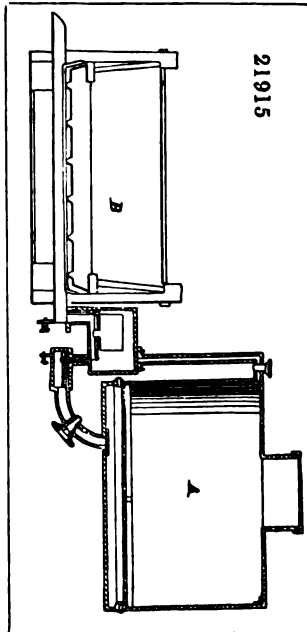
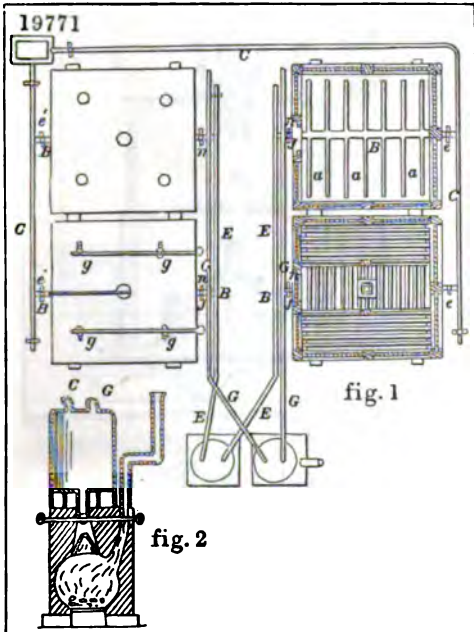


22038



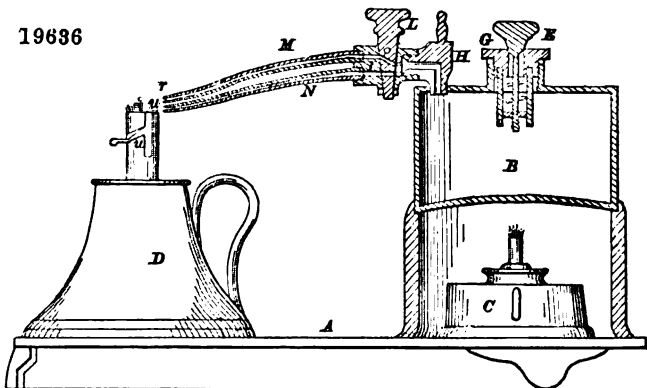








19636



21085

fig. 1

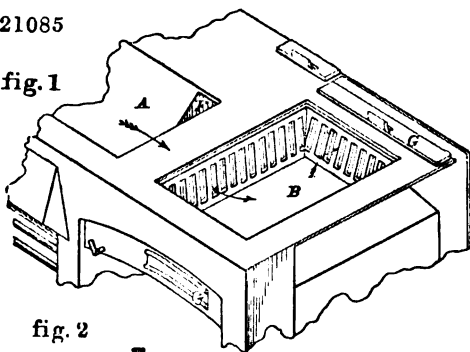
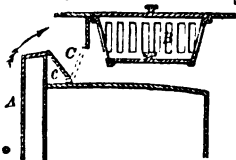
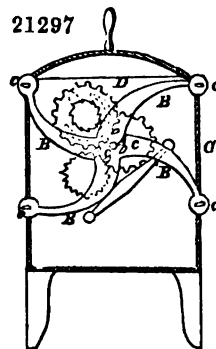


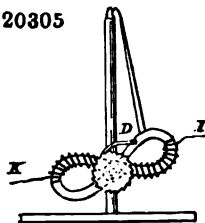
fig. 2



21297



20305



20304

fig. 1

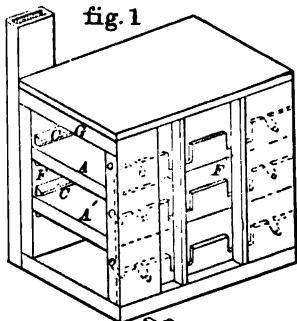
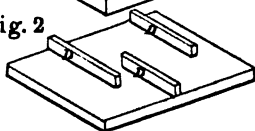
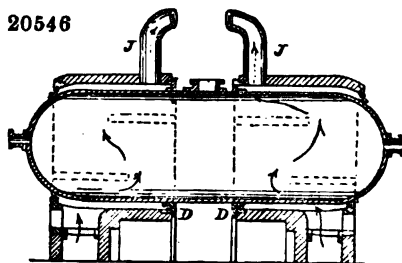


fig. 2



20546



19481

fig. 1

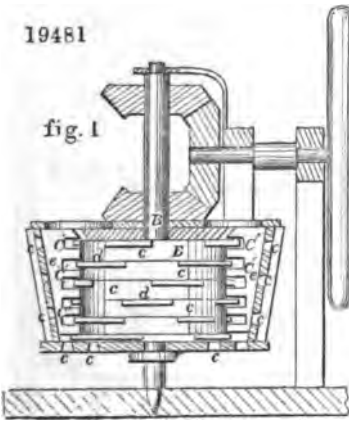
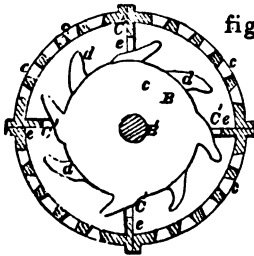
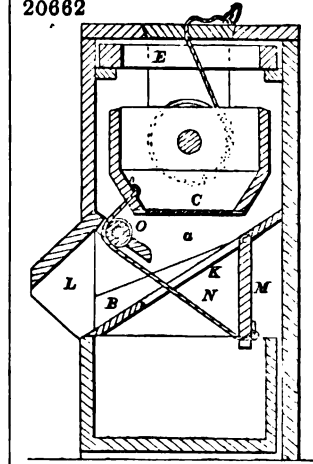


fig. 2



20662



21115

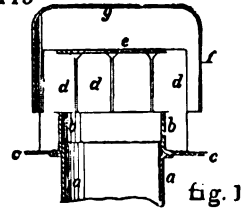
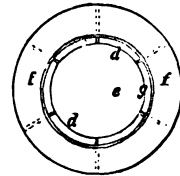


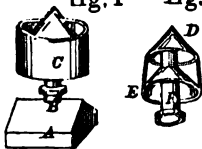
fig. 2



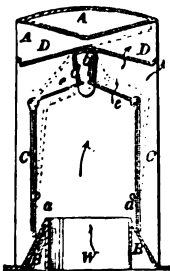
21884

fig. 1

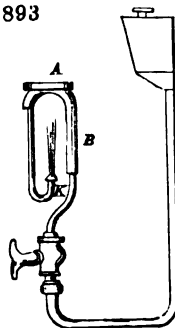
fig. 2



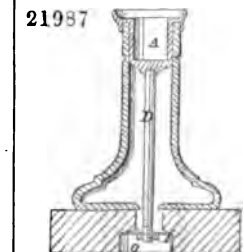
22112

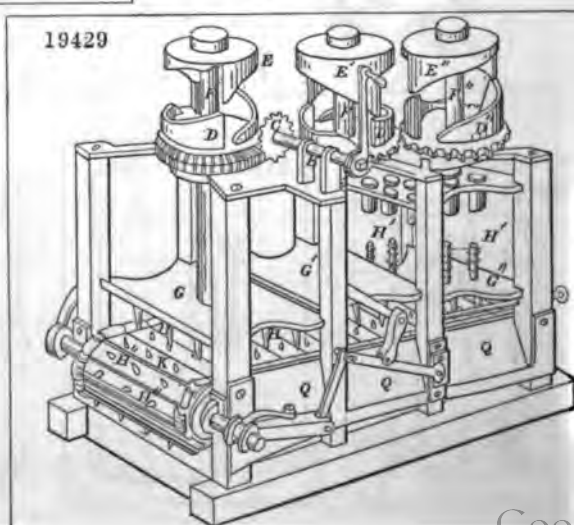
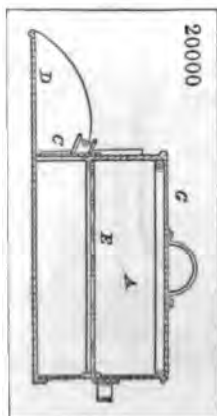
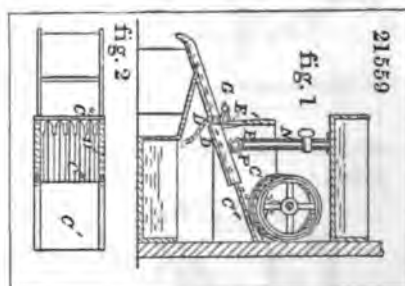
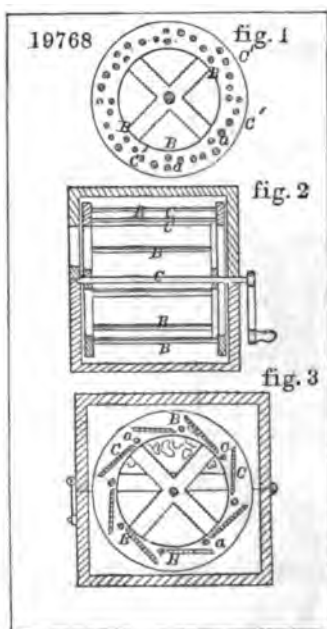
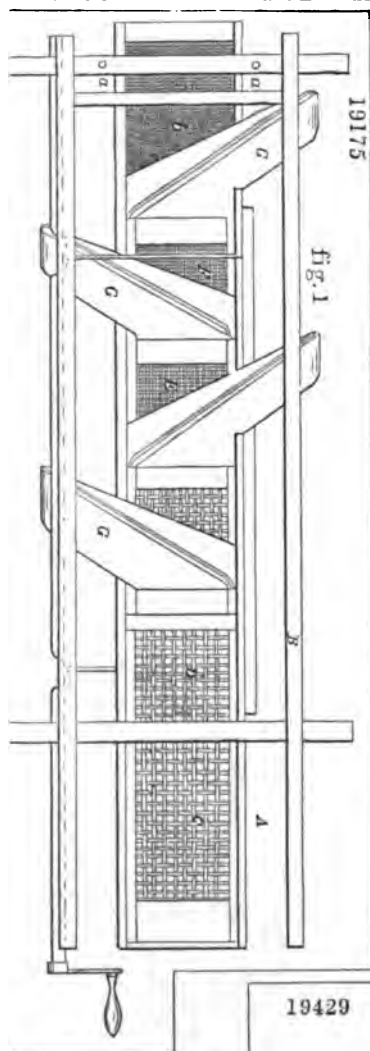


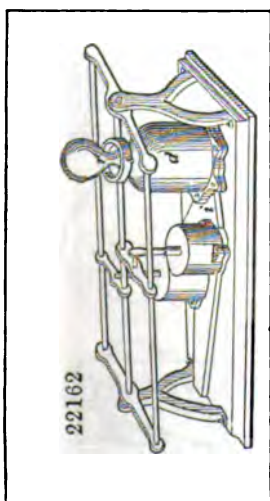
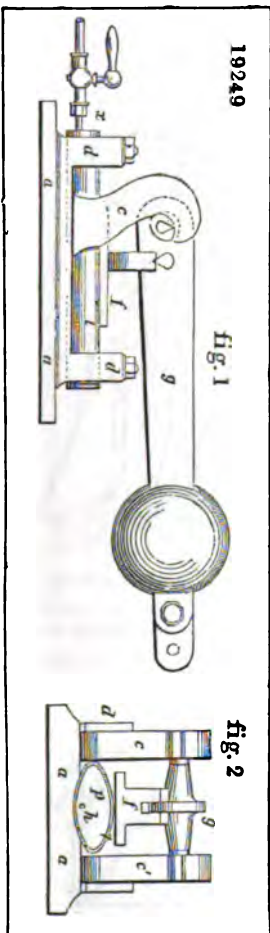
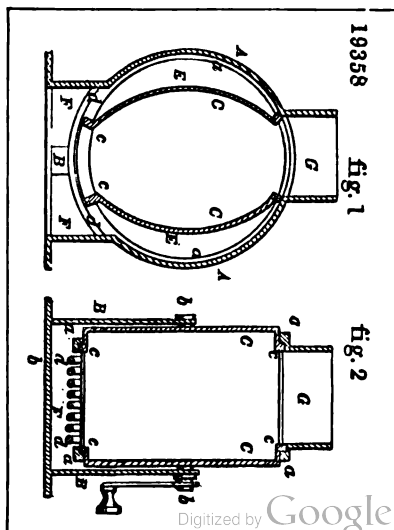
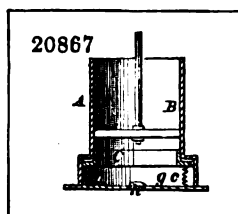
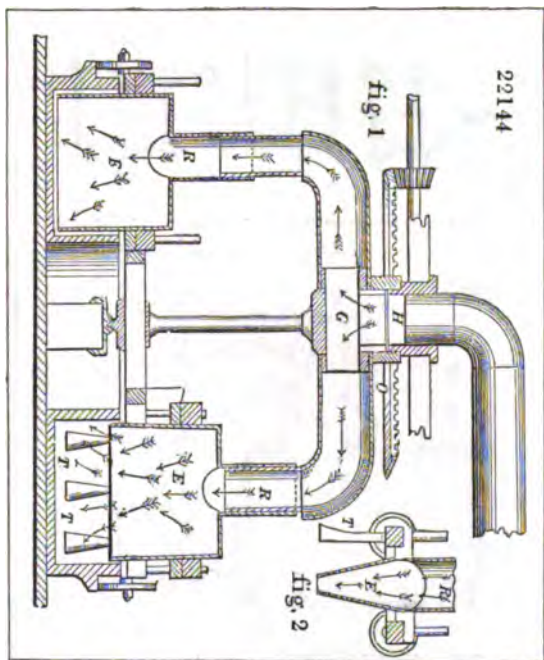
21893

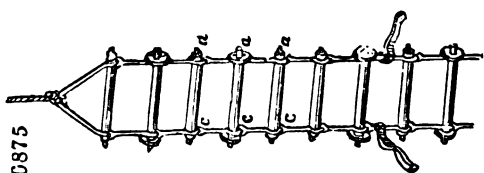


21987

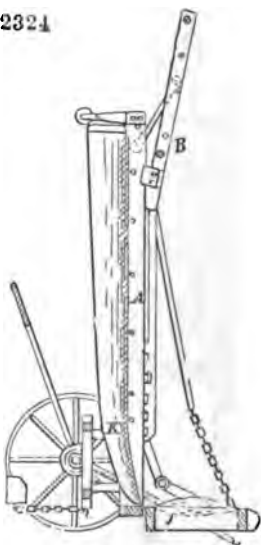




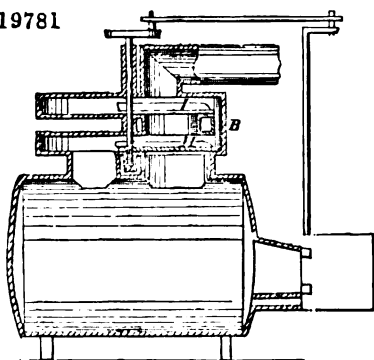




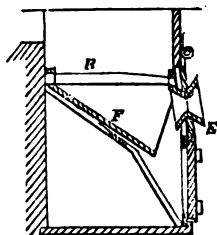
22324



19781



20836



21094

fig. 1

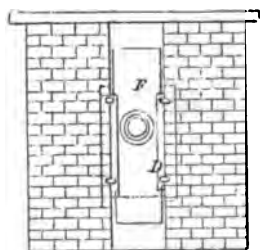
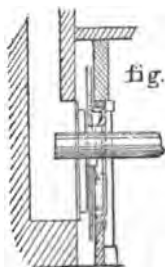


fig. 2

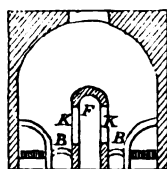


22358

fig. 1



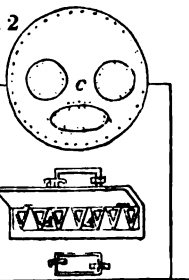
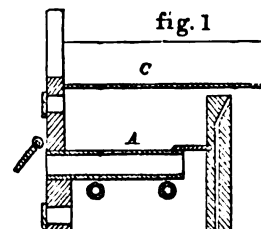
fig. 2



19942

fig. 2

fig. 1



20640

fig 1

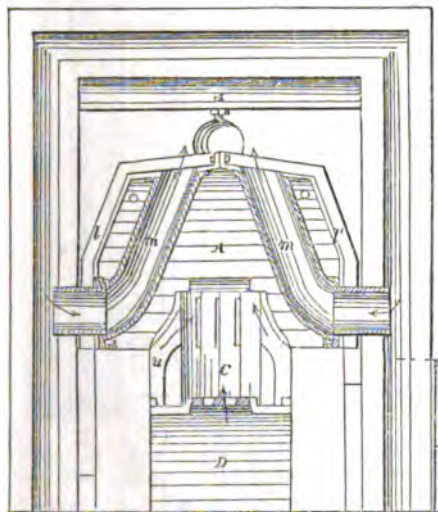
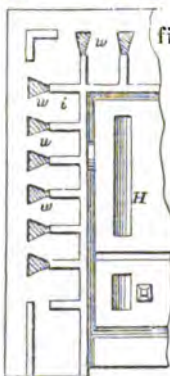


fig. 2



fig. 3



22382

fig. 1

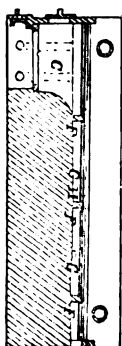
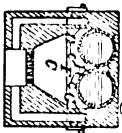


fig. 2



20591

fig. 1

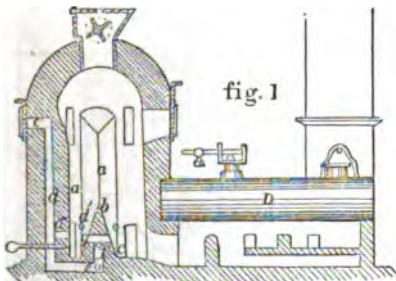
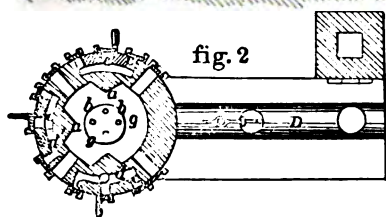


fig. 2



22067

fig 1

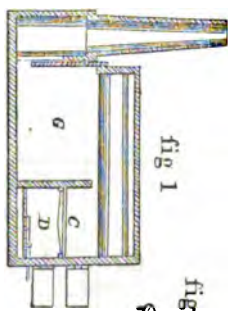
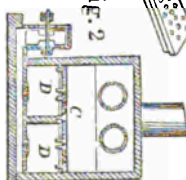


fig. 3



fig. 2



22424

fig. 1

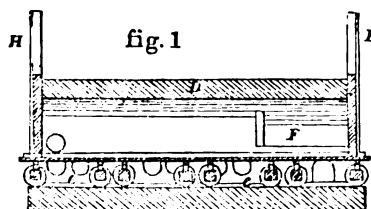
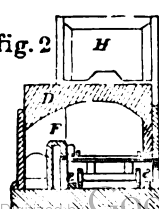
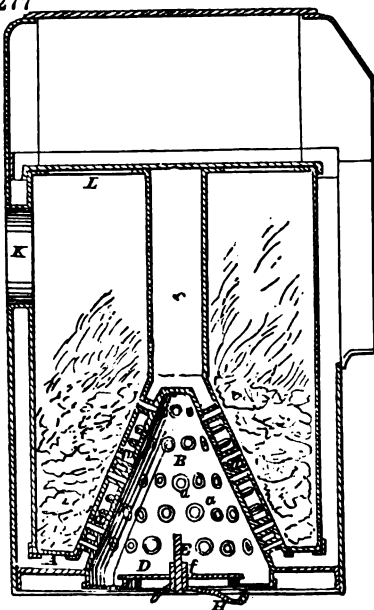


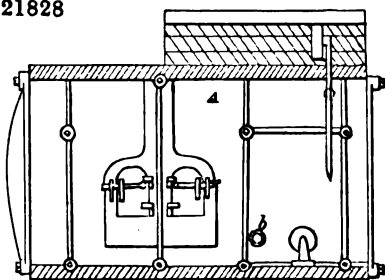
fig. 2



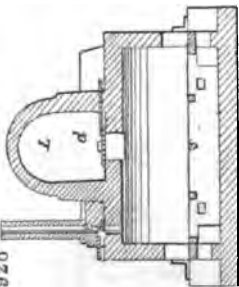
19277



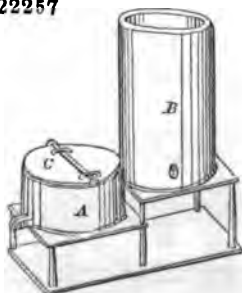
21828



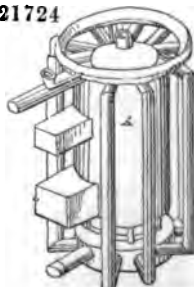
20026



22257



21724



20016

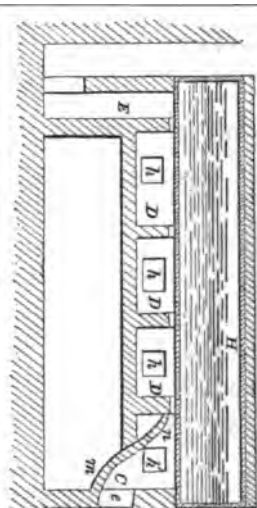
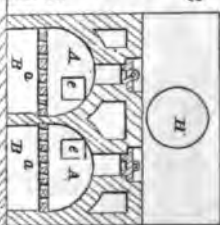
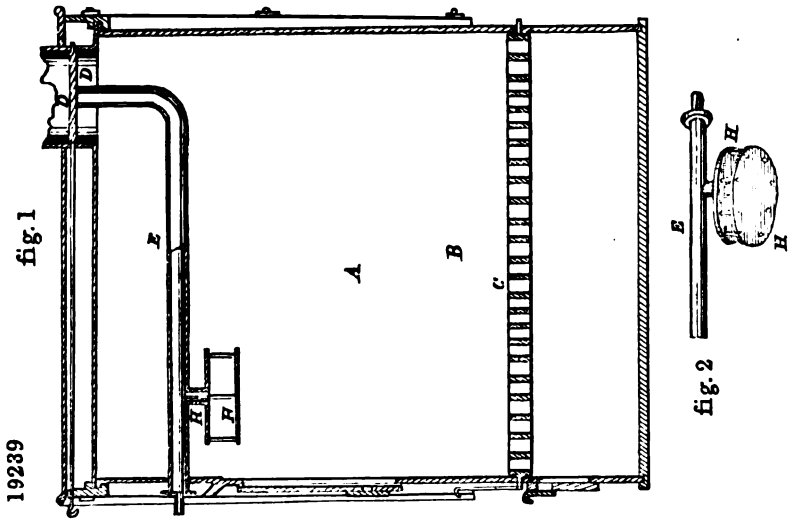


fig. 1

fig. 2





19683

fig. 1

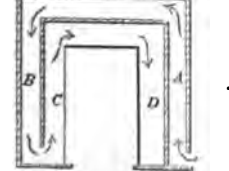
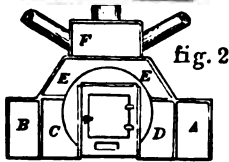
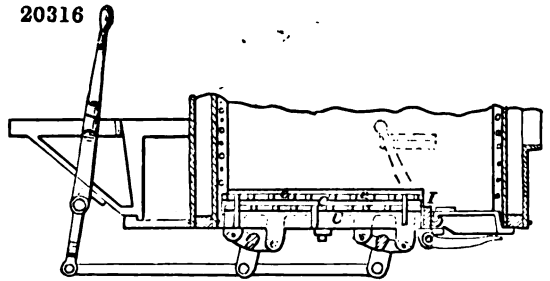


fig. 2



20316



20454

fig. 1

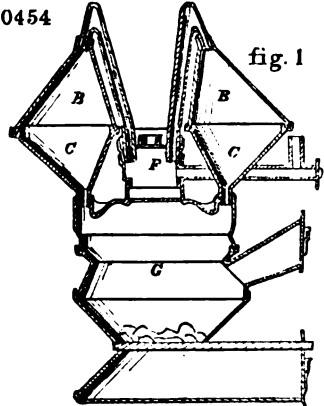


fig 2



22041

fig. 1

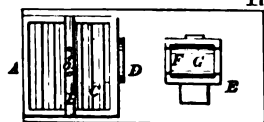
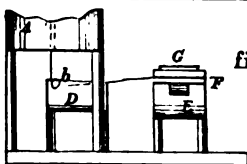
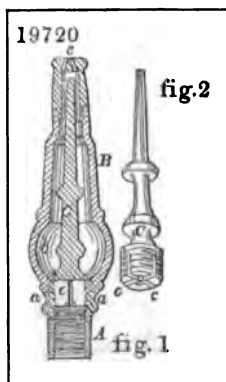
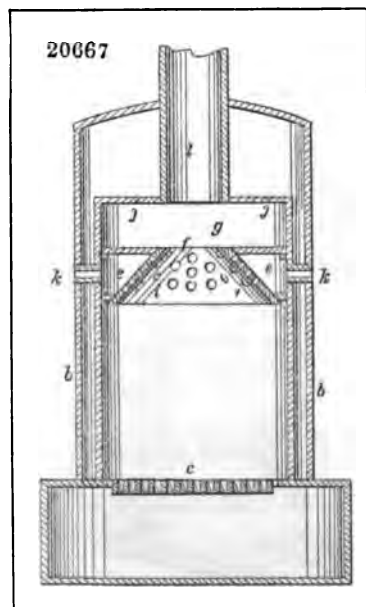
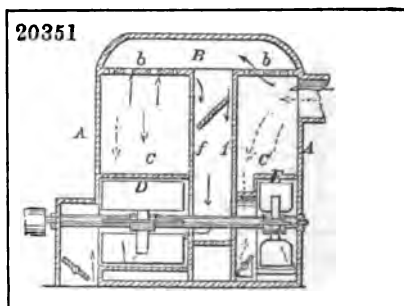
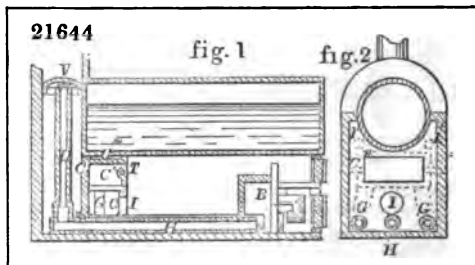
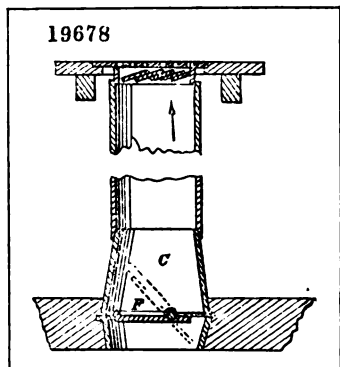
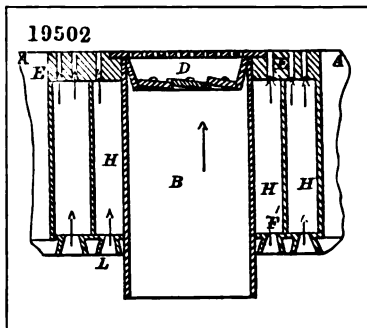
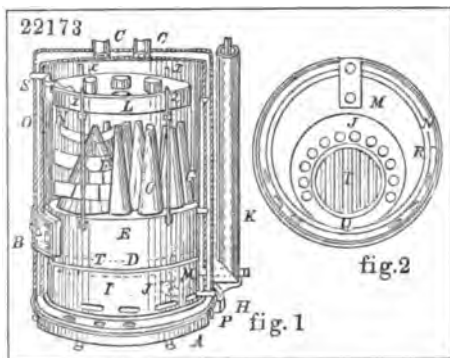


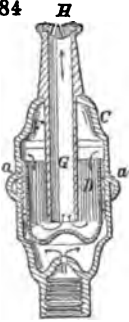
fig. 2







20584



20626

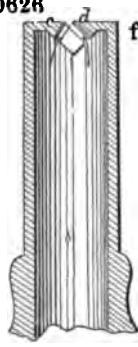


fig. 1

fig. 2

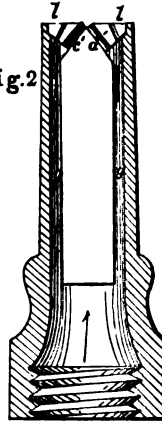


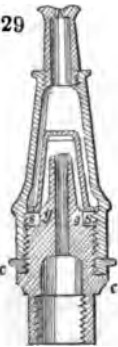
fig. 3



fig. 4



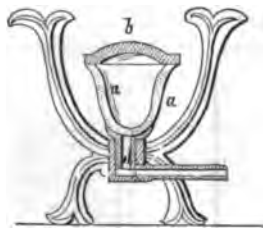
21229



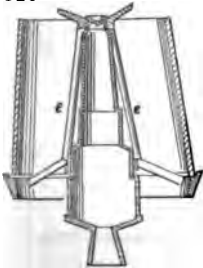
21497



21076



21586



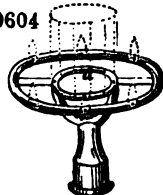
21728

fig. 1

fig. 2



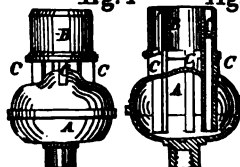
20604



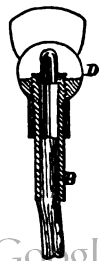
21090

fig. 1

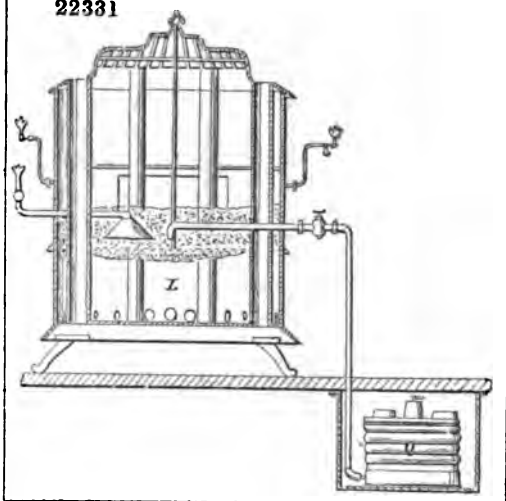
fig. 2



21783



22331

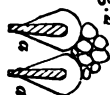


22134

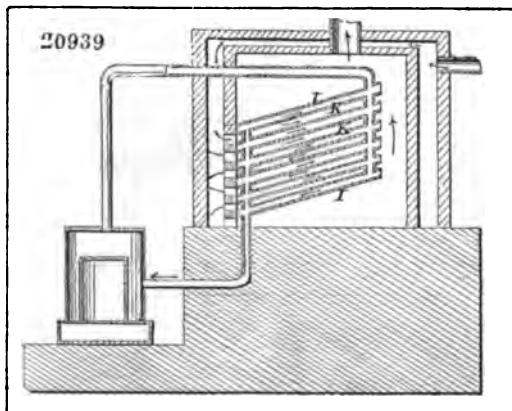
fig. 1



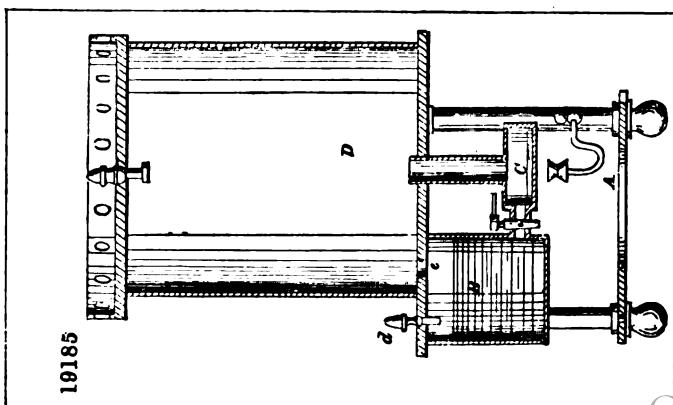
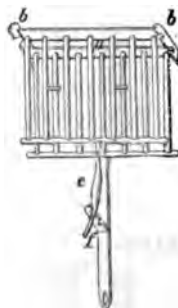
fig. 2



20939



21157



10185

19197

fig. 1

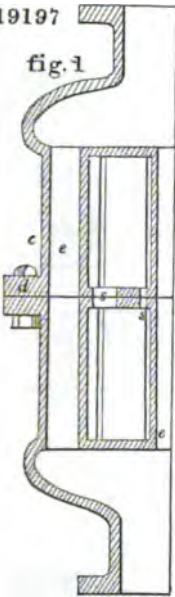
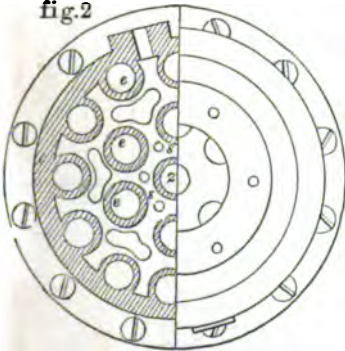


fig. 2



20917

fig. 1

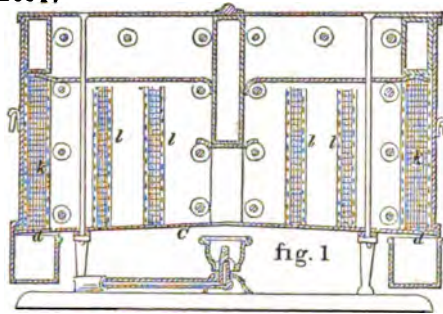
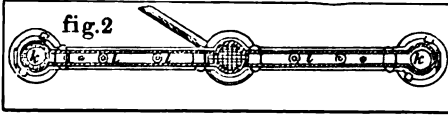


fig. 2



21195

fig. 2

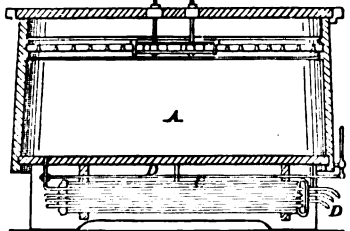
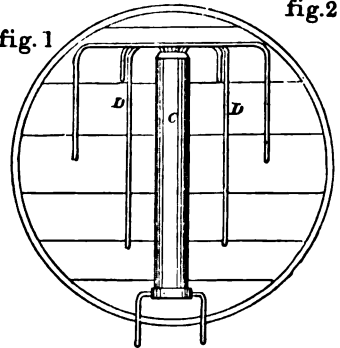
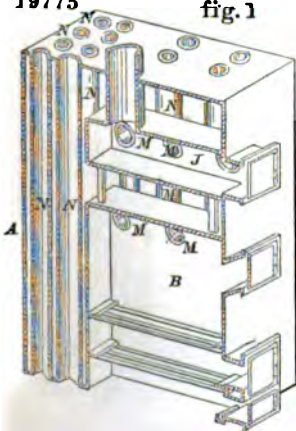


fig. 1



19775

fig. 1



21185

fig. 1

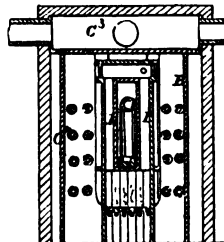
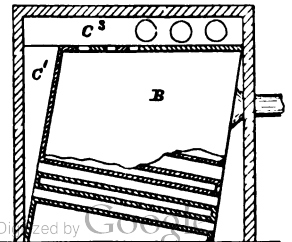
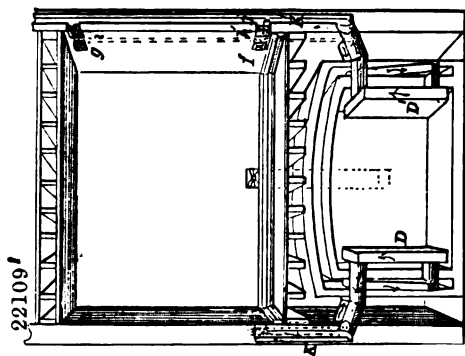


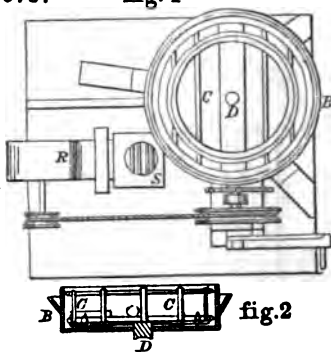
fig. 2





20767

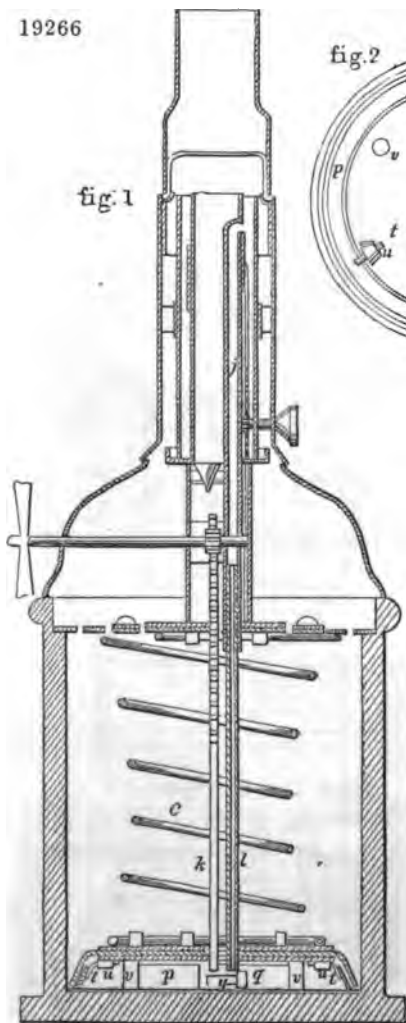
fig. 1



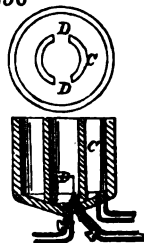
19266

fig. 1

fig. 2



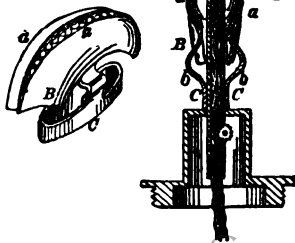
20856

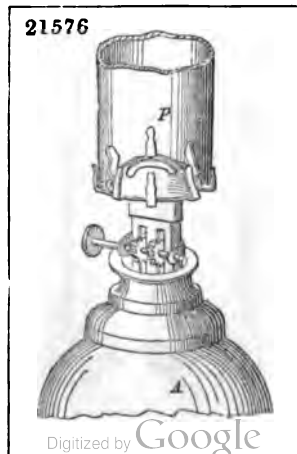
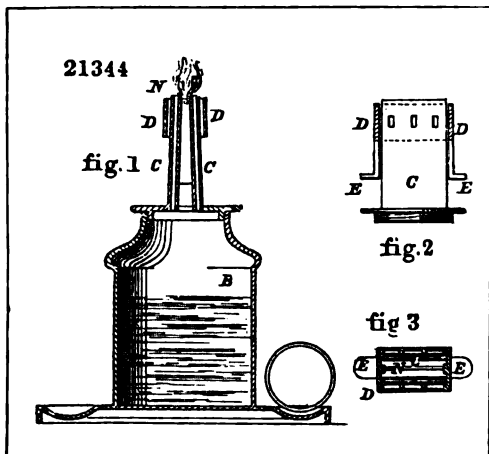
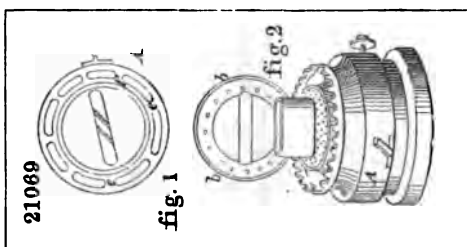
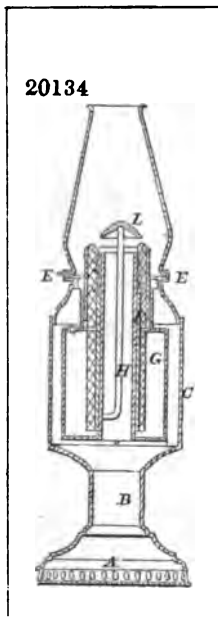
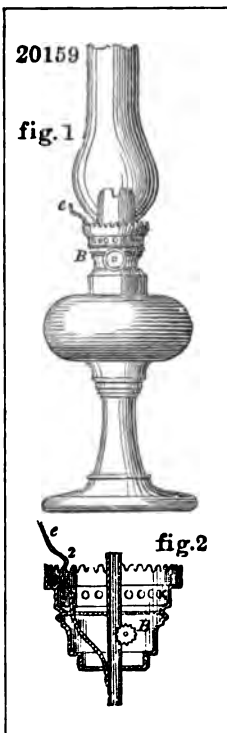
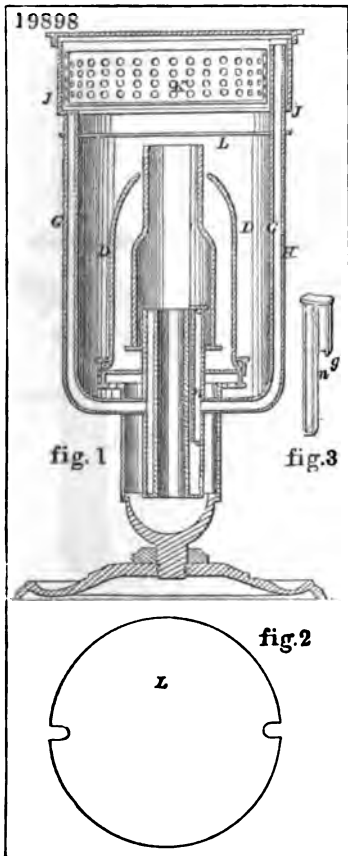


19896

fig. 1

fig. 2





22237

fig. 1

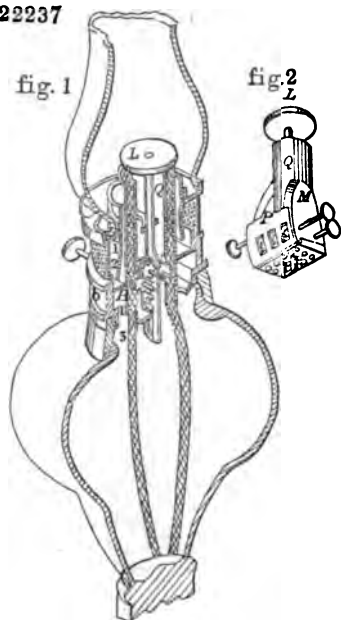
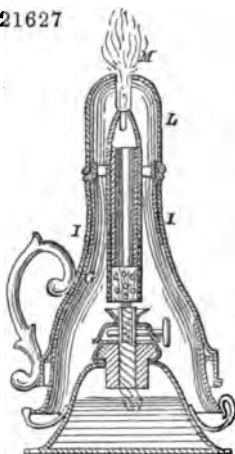


fig. 2

21627



20977

fig. 1

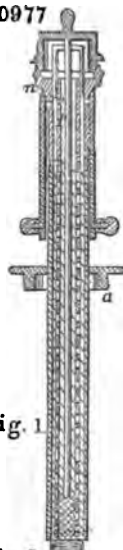


fig. 2

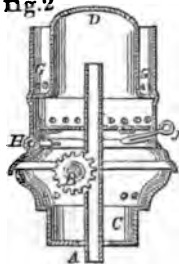


19885

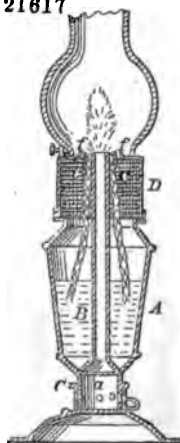
fig. 1



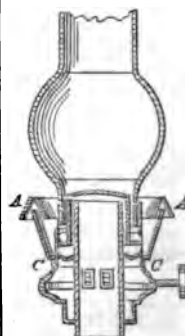
fig. 2



21617



20178



22409

fig. 1

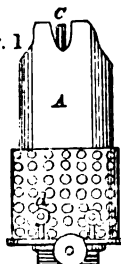
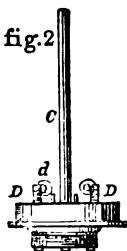
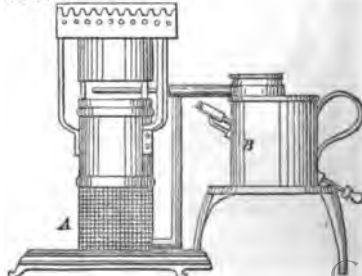


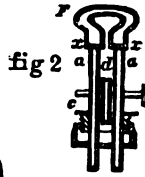
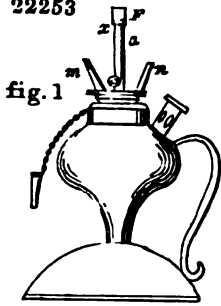
fig. 2



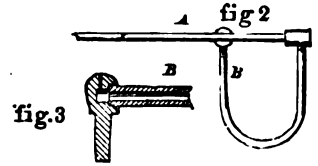
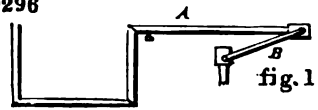
20289



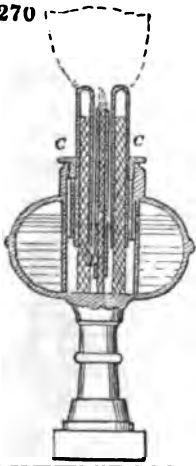
22253



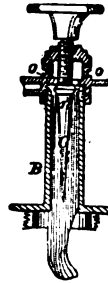
20296



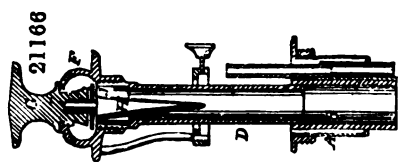
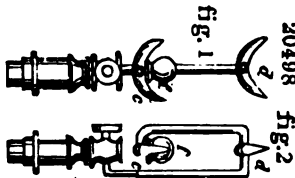
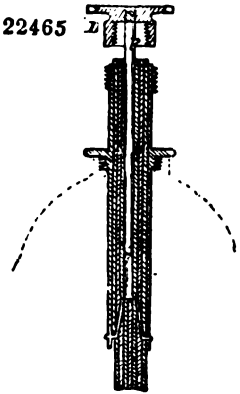
22270



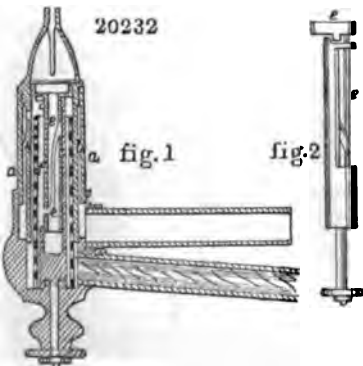
22230



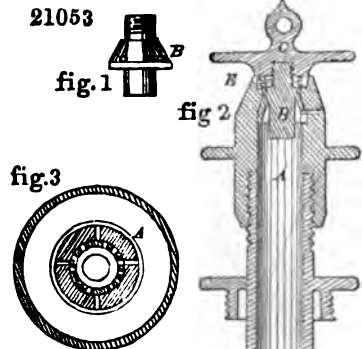
22465



20232



21053



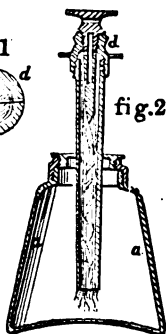


20153

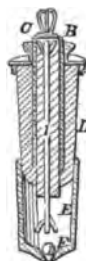
fig. 1



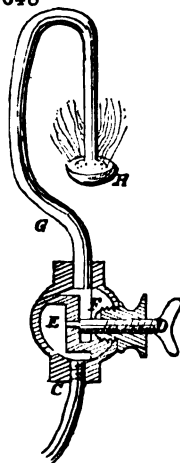
fig. 2



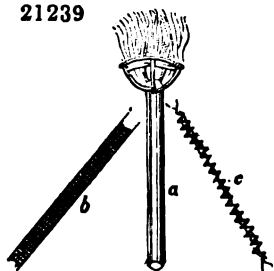
20746



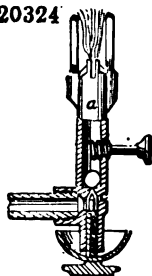
20648



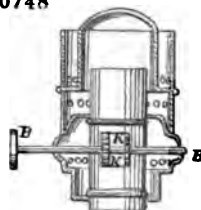
21239



20324



20748



20641

fig. 1

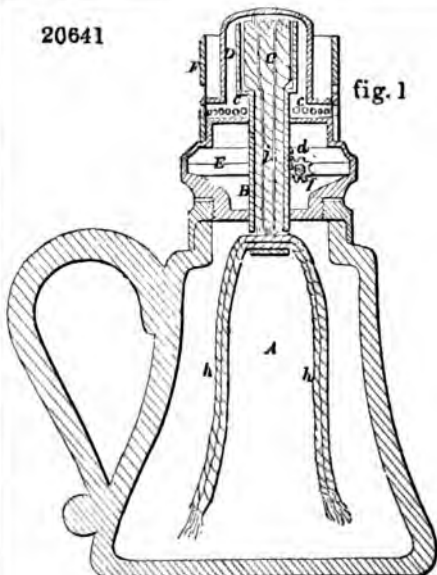
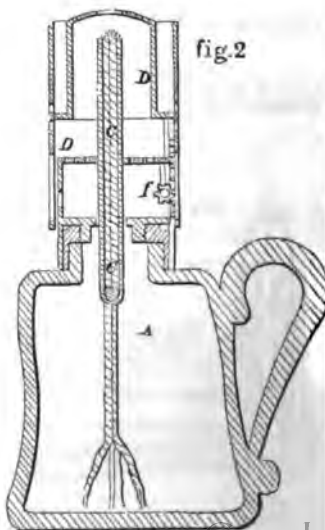
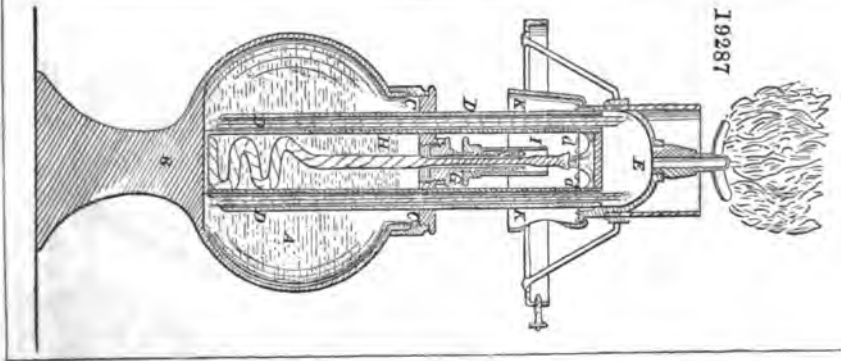


fig. 2





22099

fig. 1

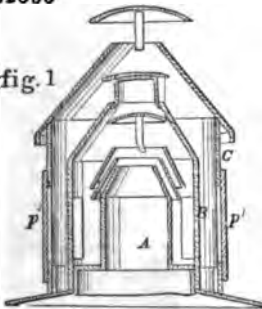
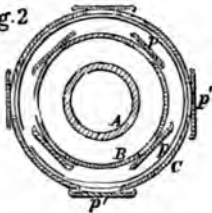


fig. 2



20573

fig. 1

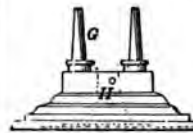
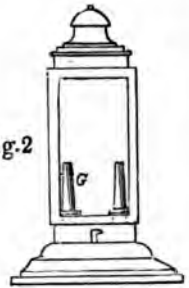


fig. 2



20373

fig. 1

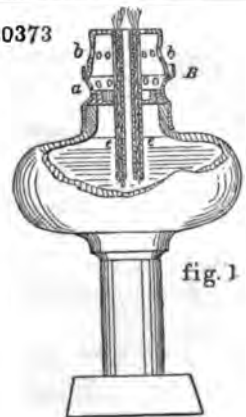
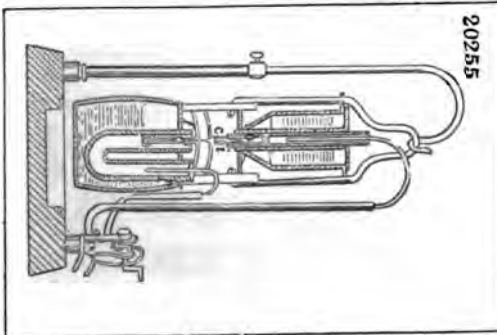
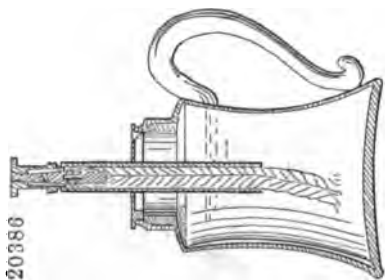
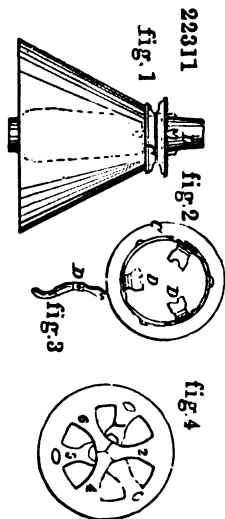
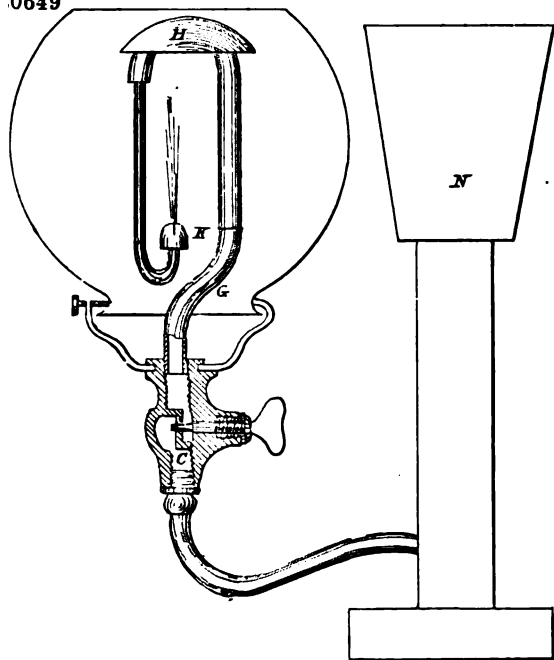


fig. 2

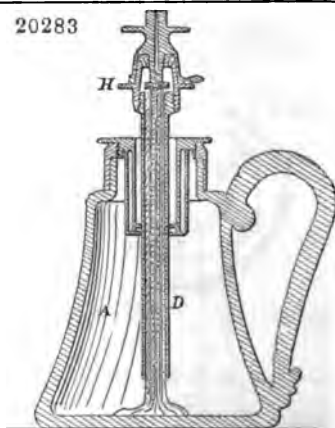


20255

0649



20283



19158

fig. 1

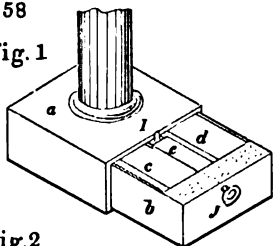
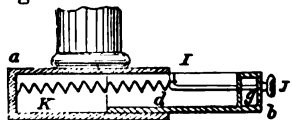
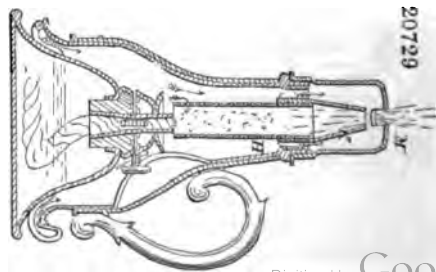


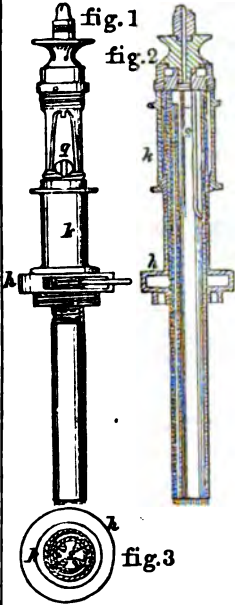
fig. 2



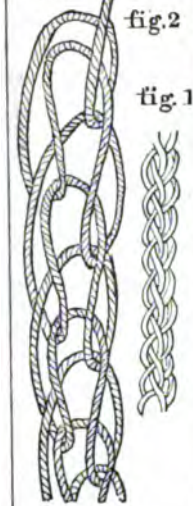
20729



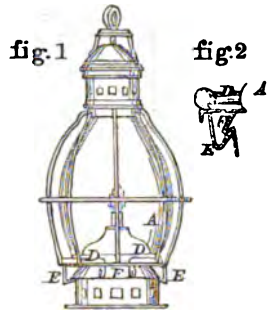
20952



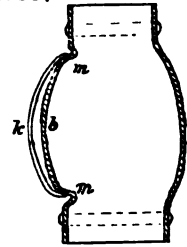
21890



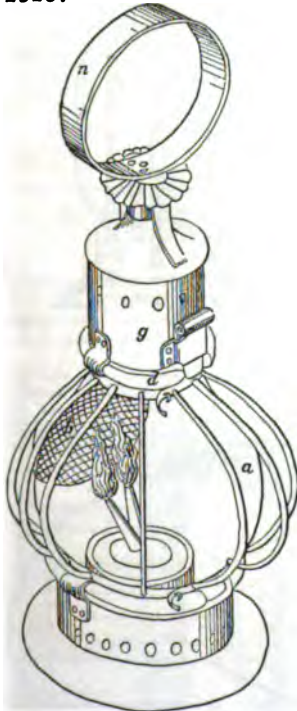
20785



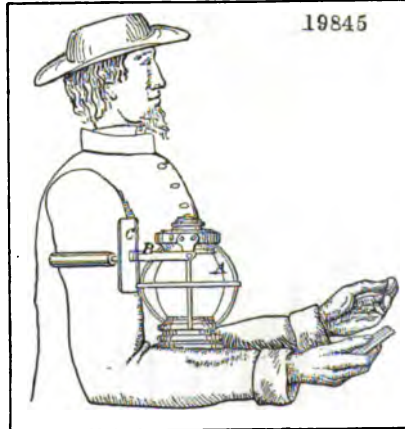
19897



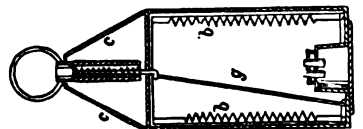
19207



19845



21521



19044

fig. 1

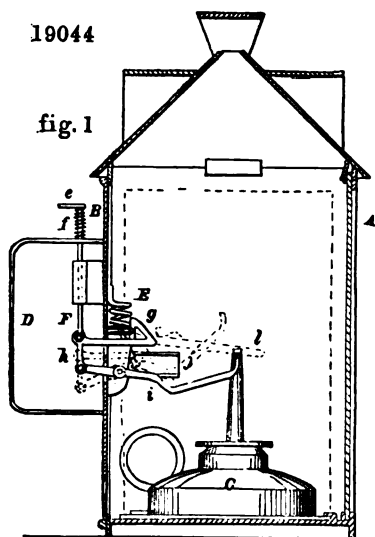
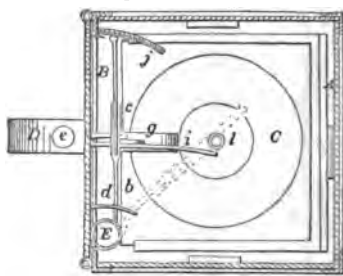


fig. 2



20404

fig. 1

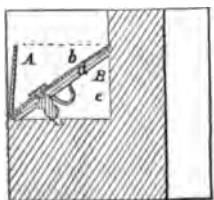
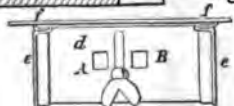


fig. 2



20302

fig. 1

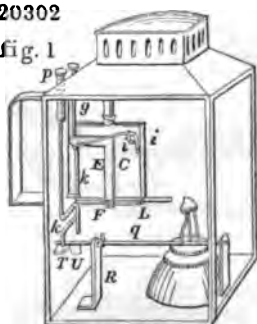
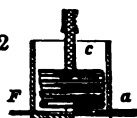
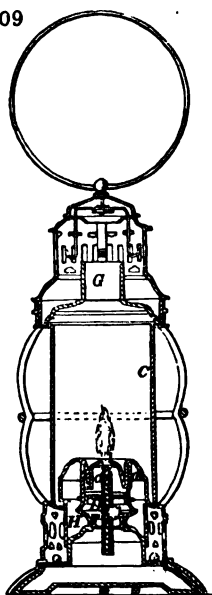


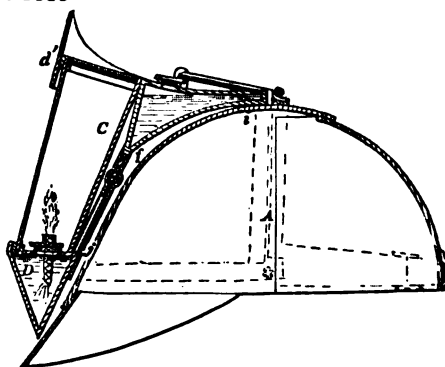
fig. 2



21209



21485



21271

fig. 1

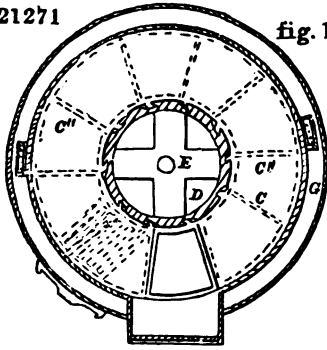
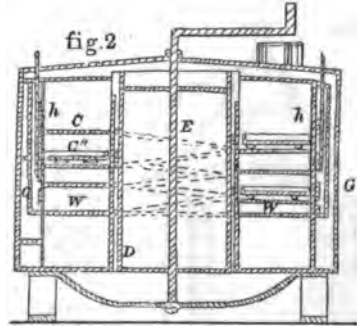


fig. 2



21147

fig. 1

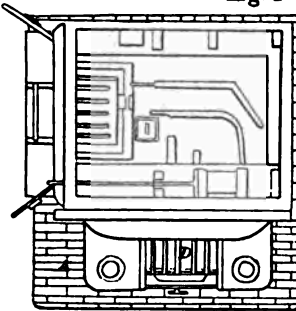
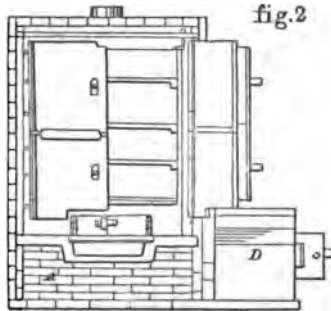
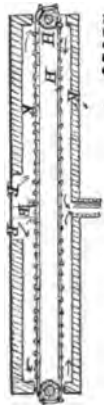


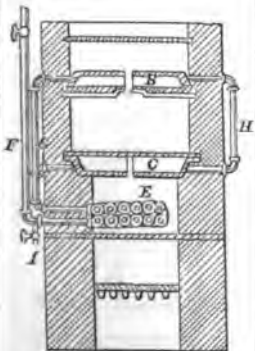
fig. 2



21620



21610



19591

fig. 1

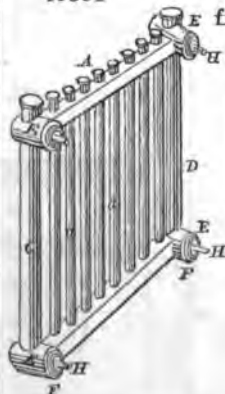
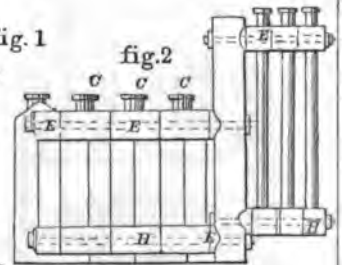
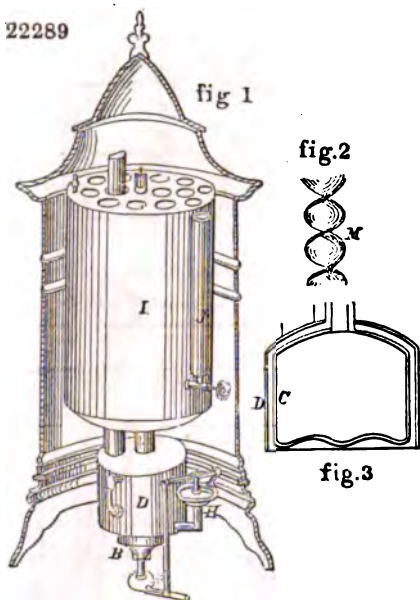


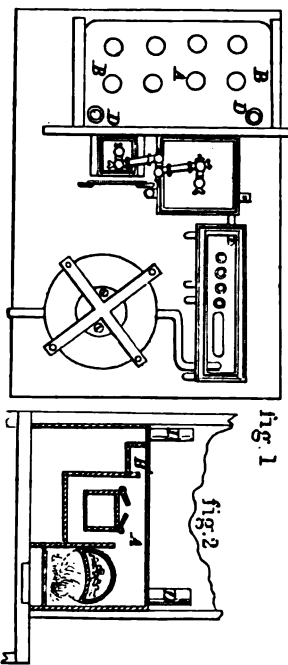
fig. 2



22289

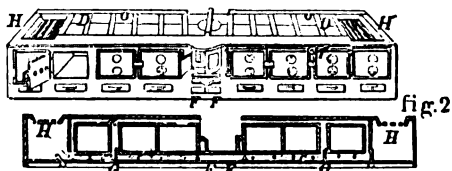


20064

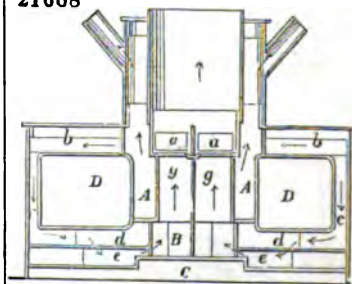


22120

fig. 1



21608



20132

fig. 1

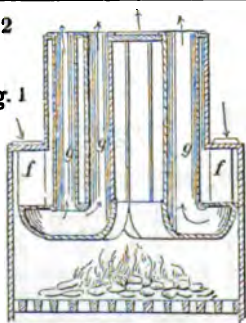
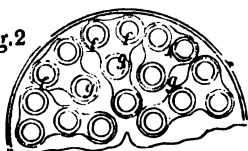
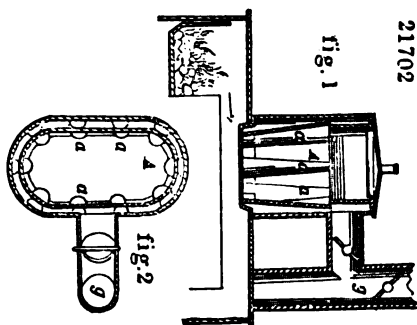


fig. 2

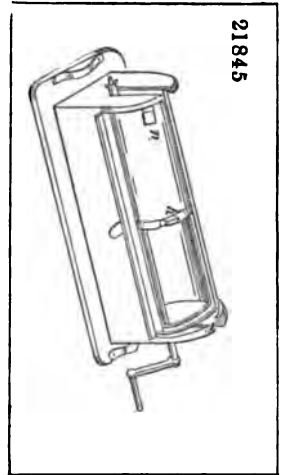


21702

fig. 1



21845



19368

fig. 1

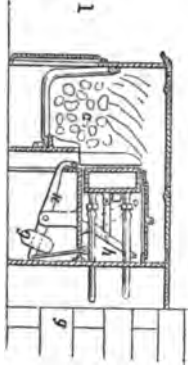
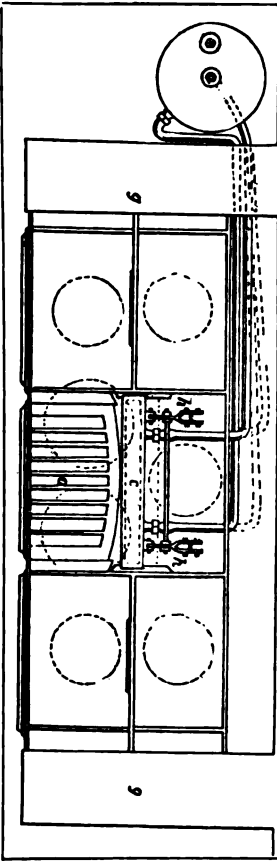
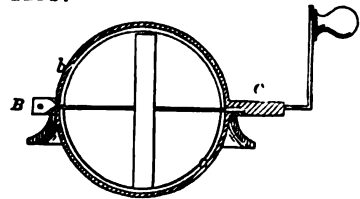


fig. 2



21387



20589



20106

fig. 1

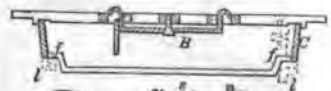


fig. 2

fig. 3

21416

fig. 1

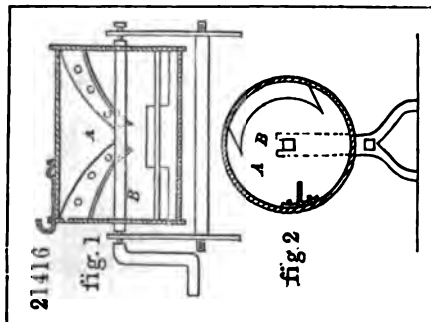
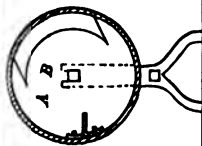


fig. 2





19923

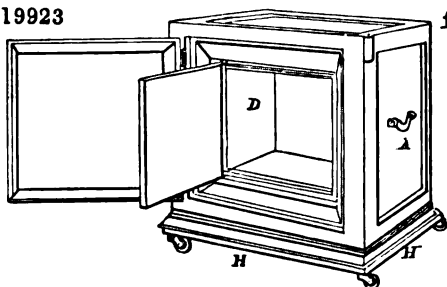
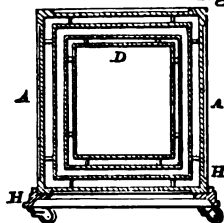
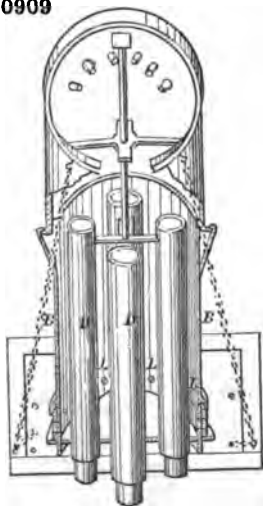


fig. 1

fig. 2



20909

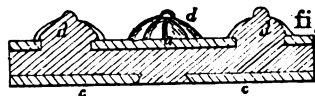


20930

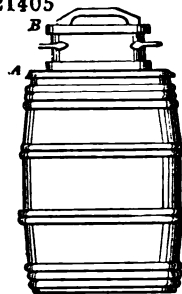
fig. 1



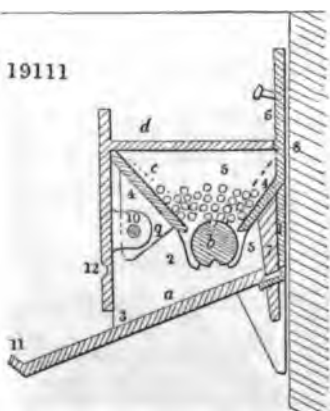
fig. 2



21405



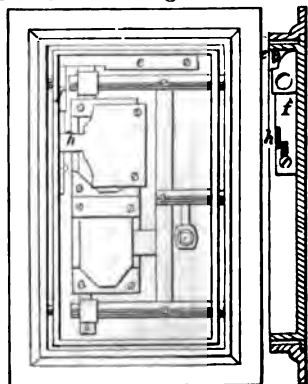
19111



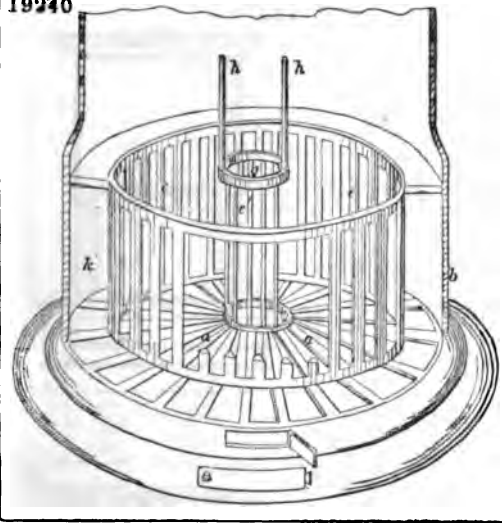
21119

fig. 1

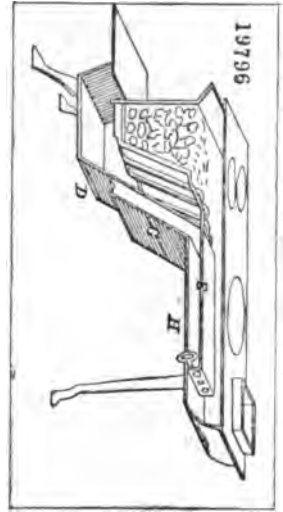
fig. 2



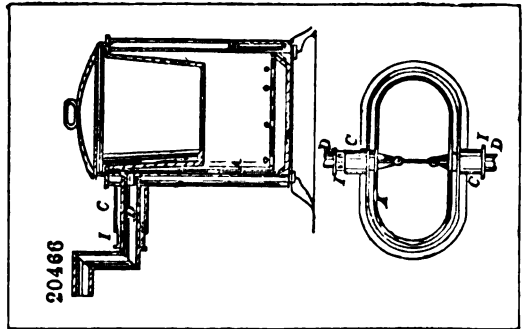
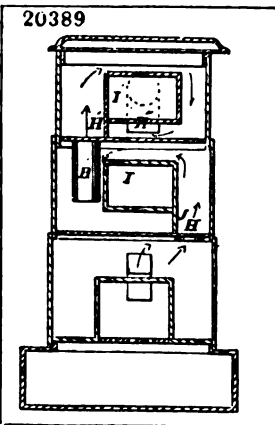
19240



19796



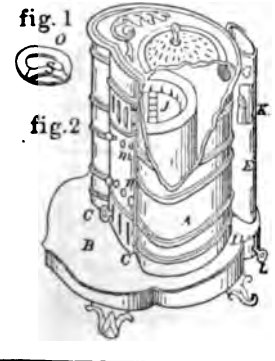
20389



21103

fig. 1

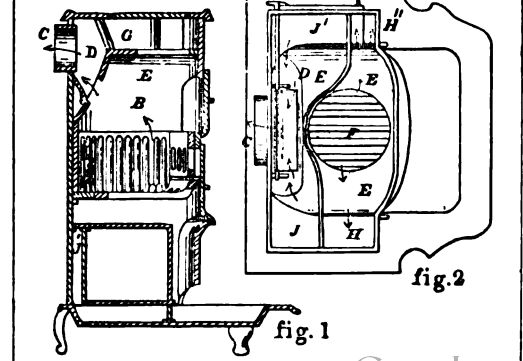
fig. 2

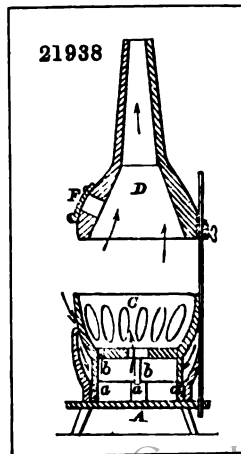
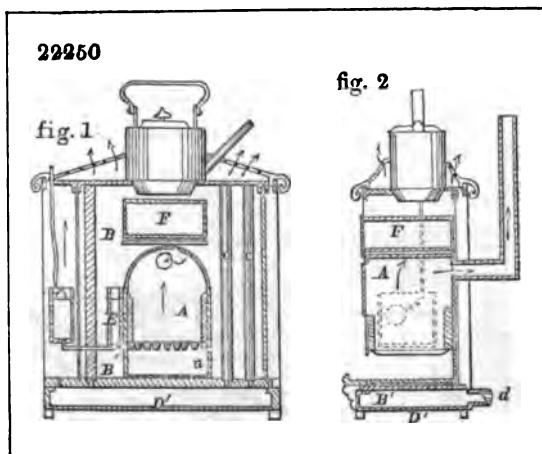
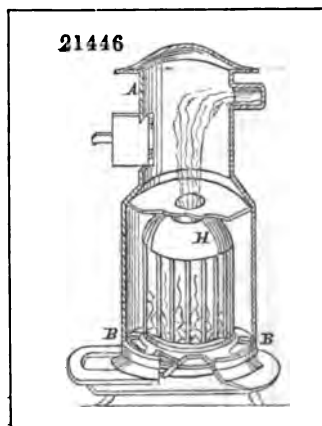
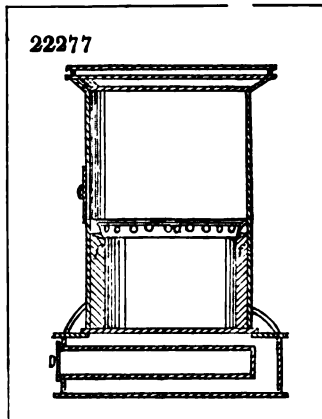
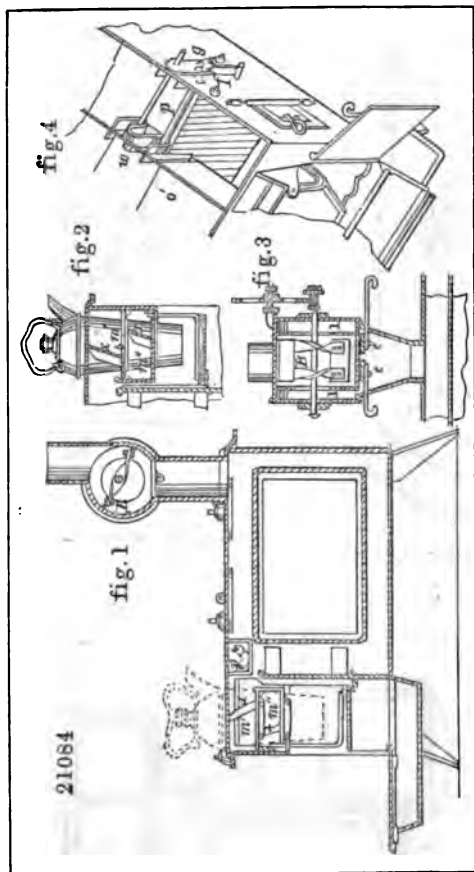


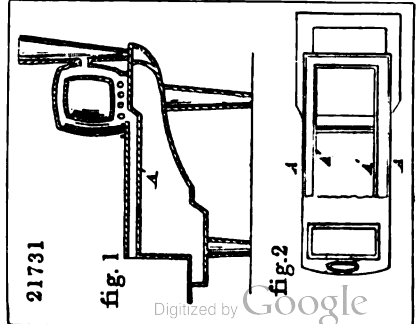
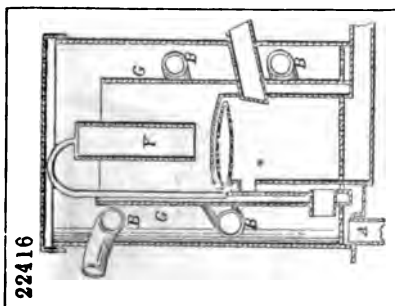
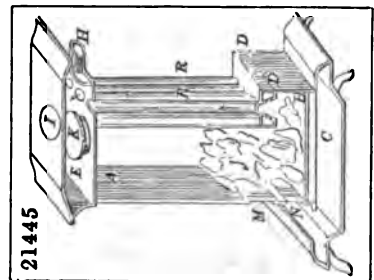
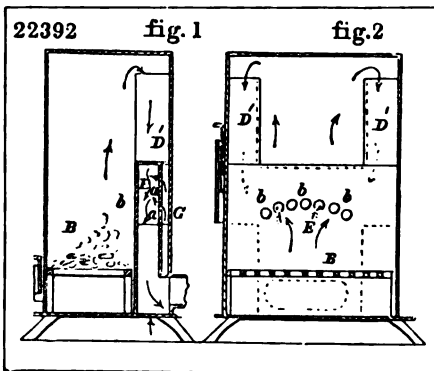
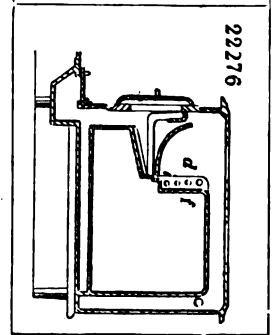
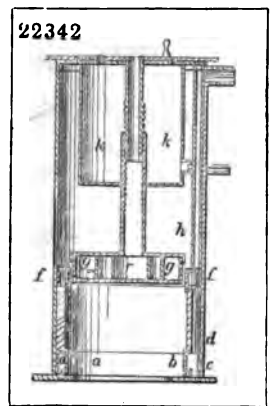
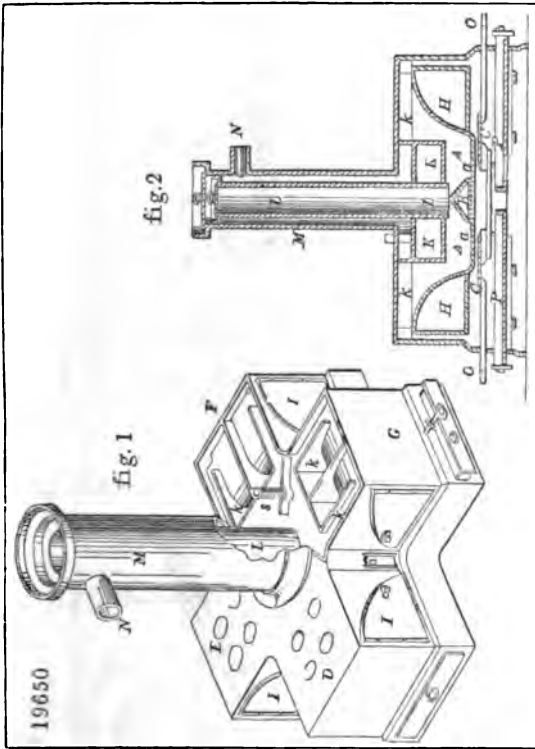
21191

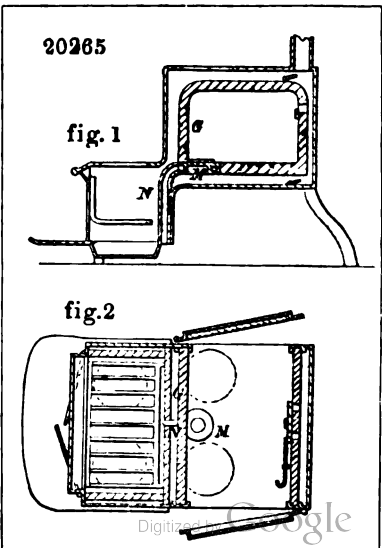
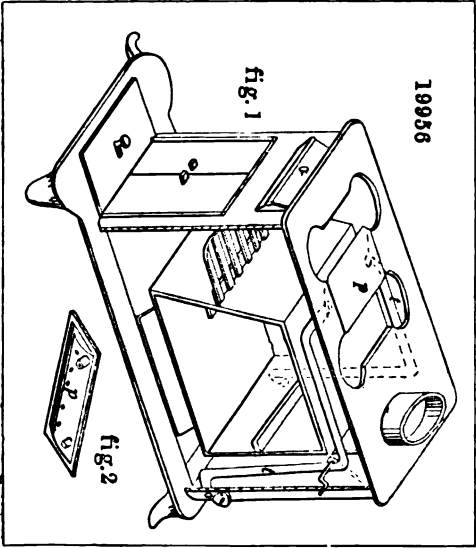
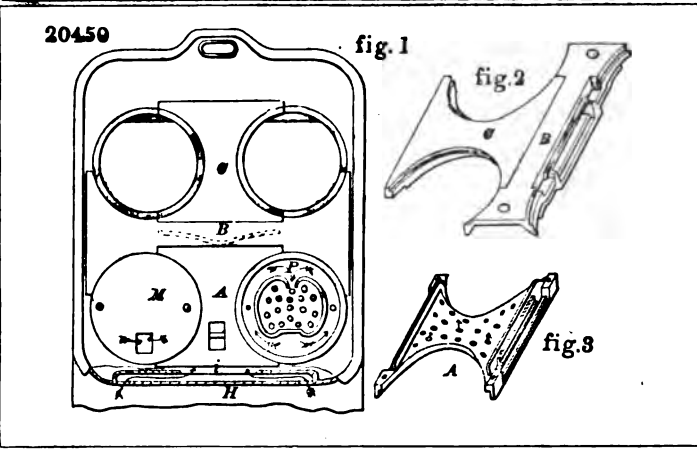
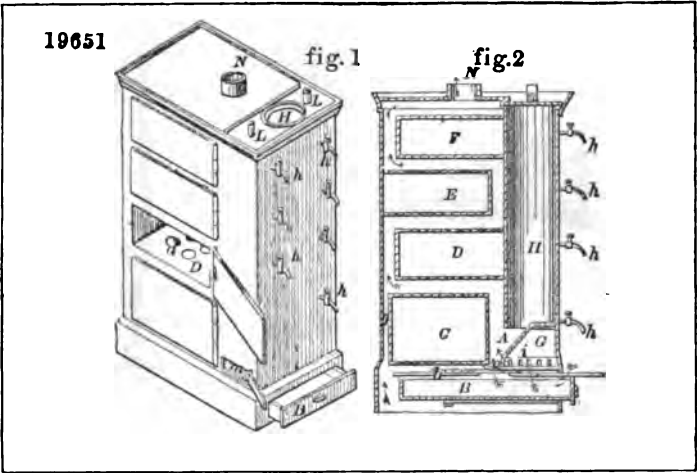
fig. 1

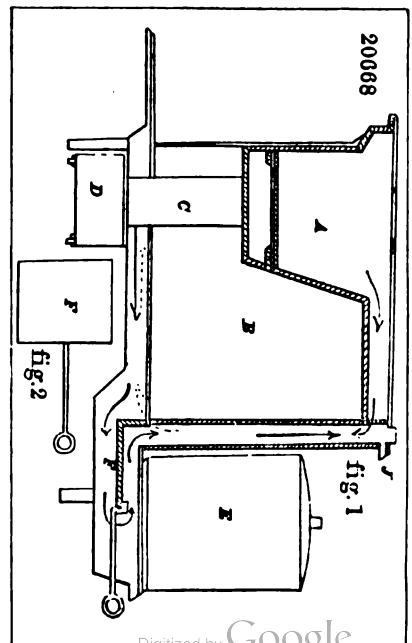
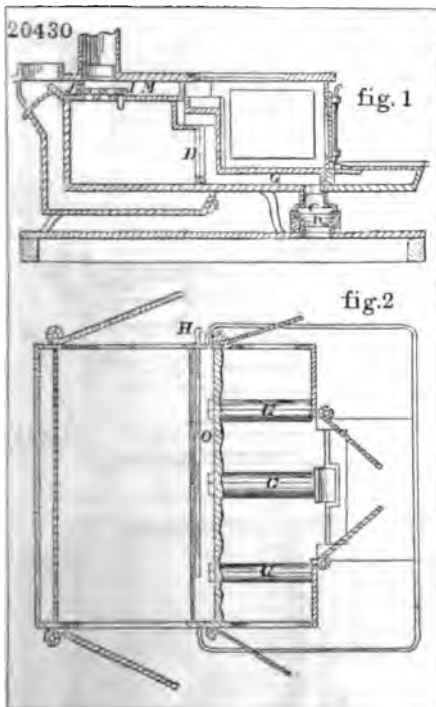
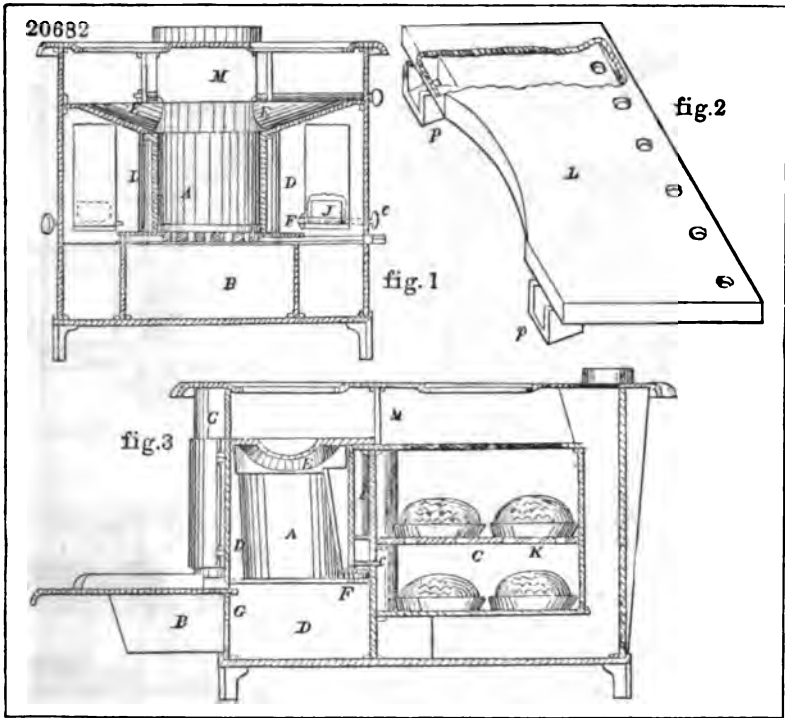
fig. 2

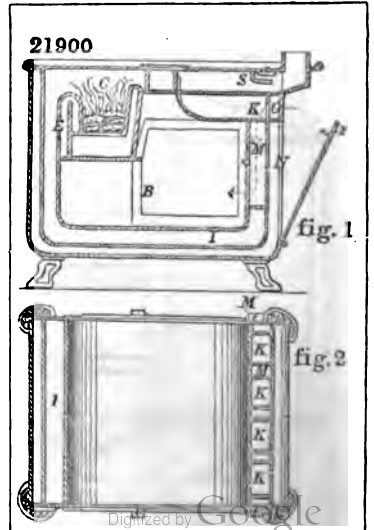
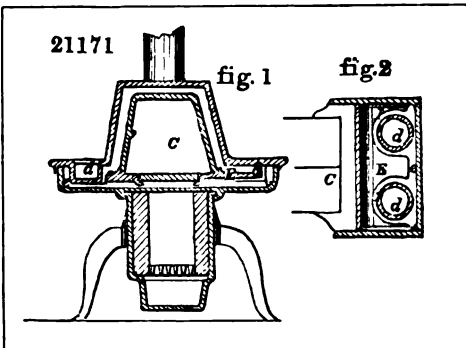
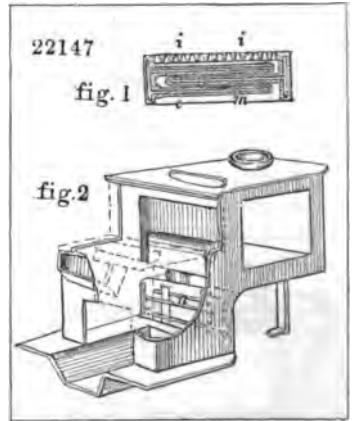
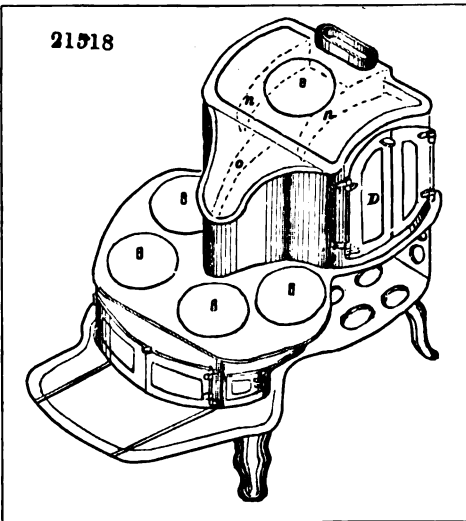
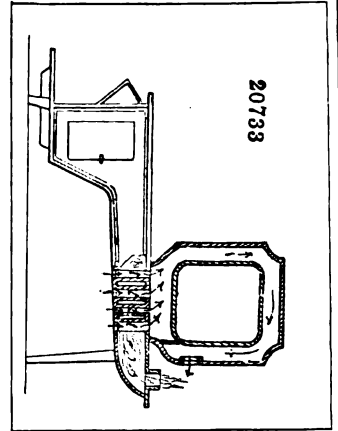
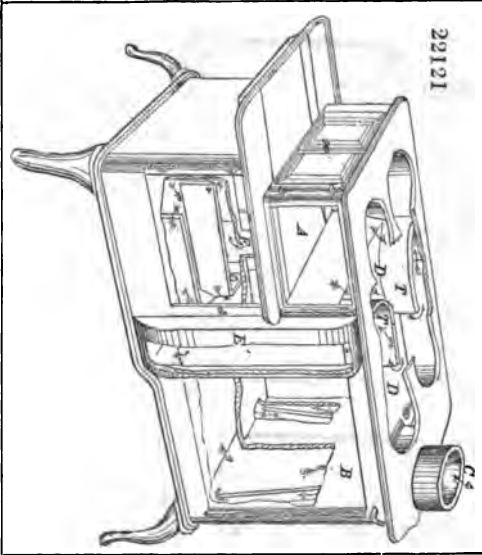




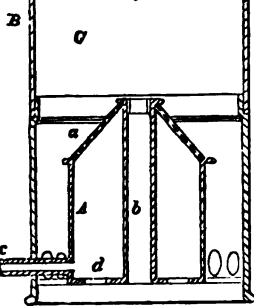
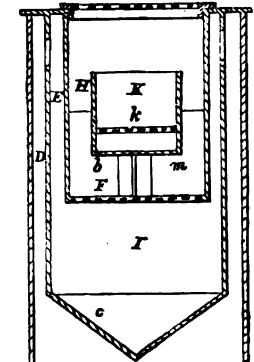




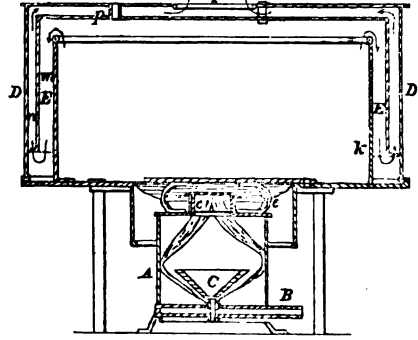




19114



22335



21075

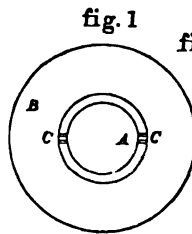
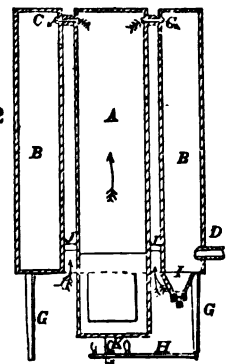
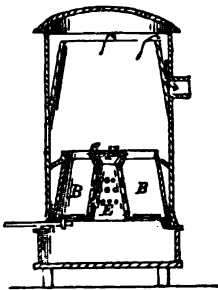


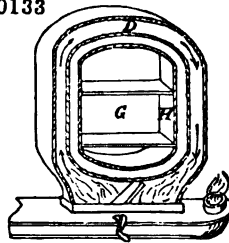
fig. 2



21046



20133



22223

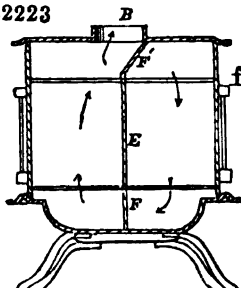
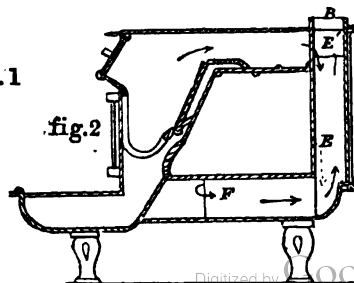
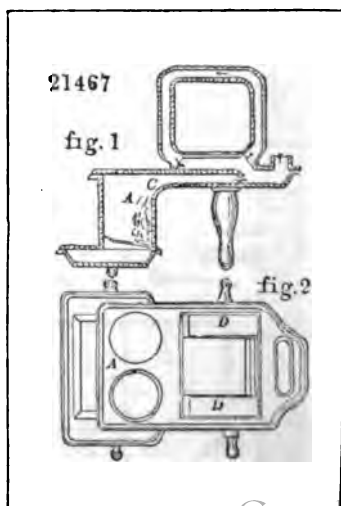
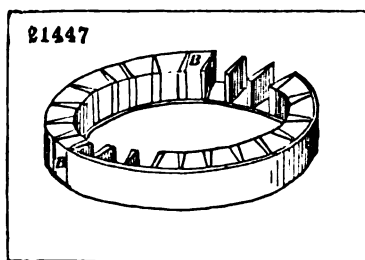
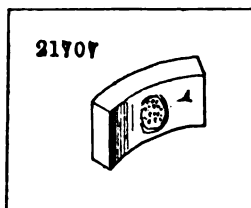
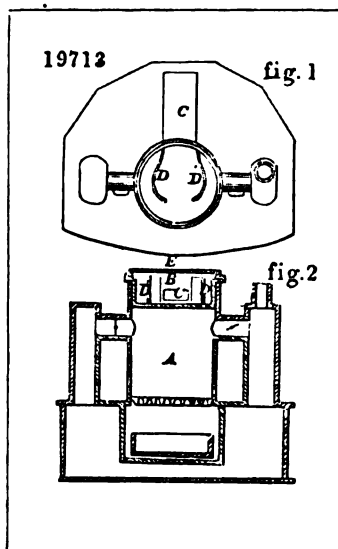
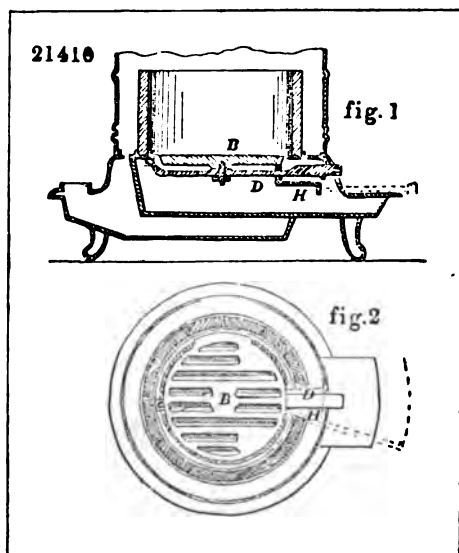
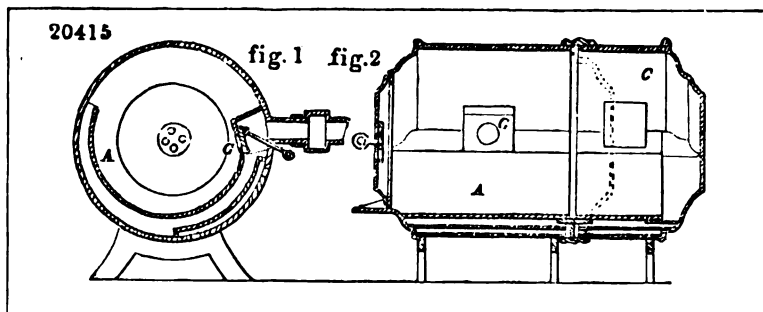


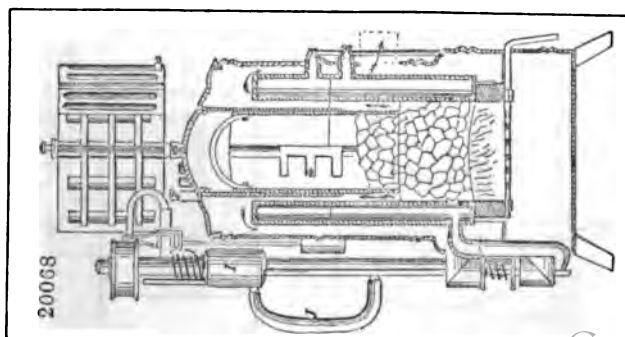
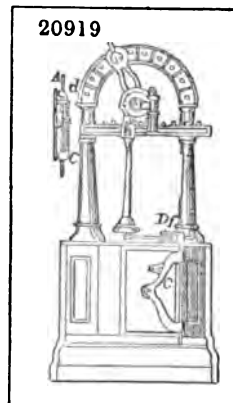
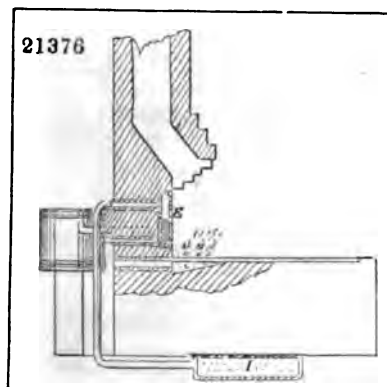
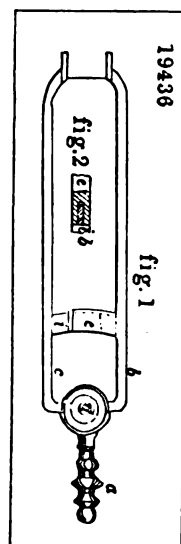
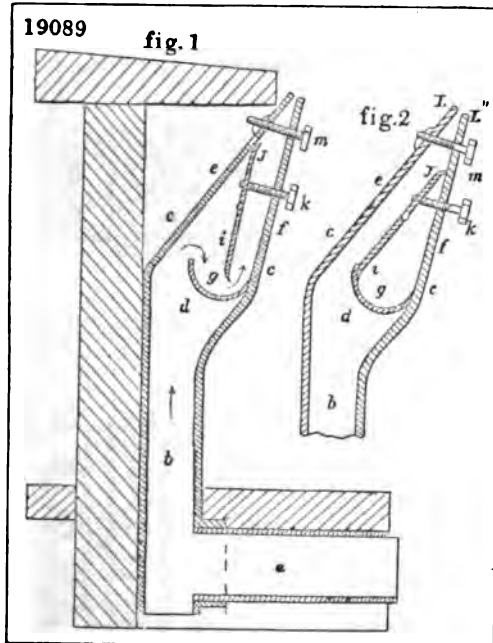
fig. 1

fig. 2





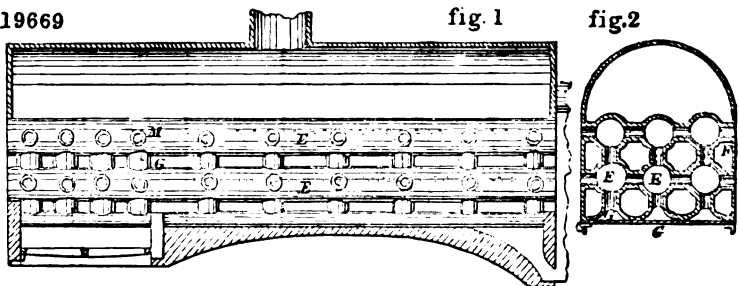




19669

fig. 1

fig. 2



9621

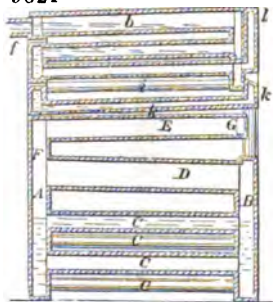
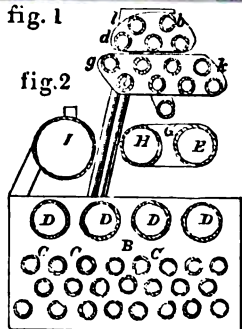


fig. 1

fig. 2



19601

fig. 1

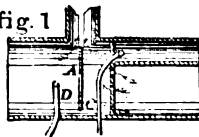
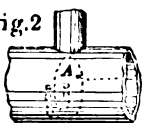
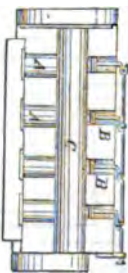


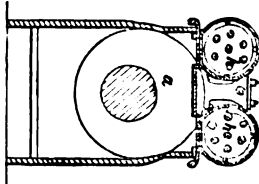
fig. 2



20802



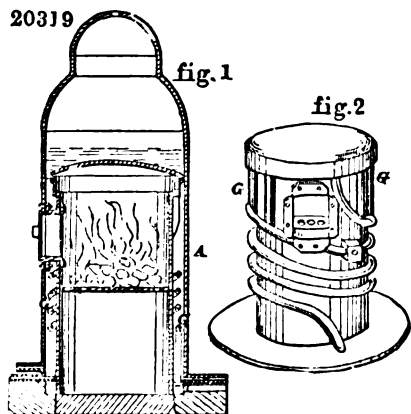
21017



20319

fig. 1

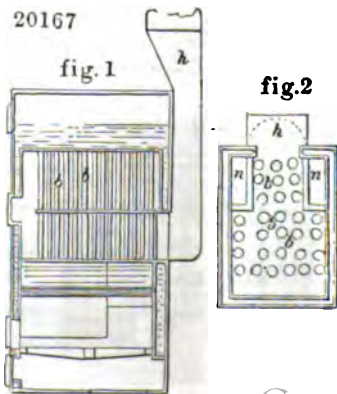
fig. 2

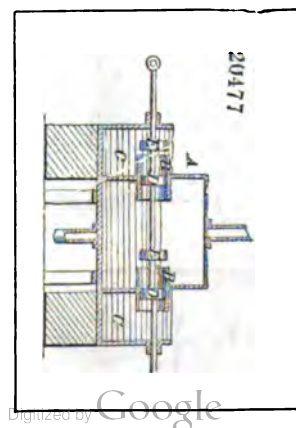
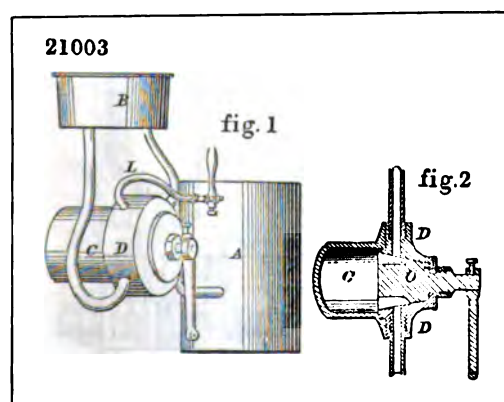
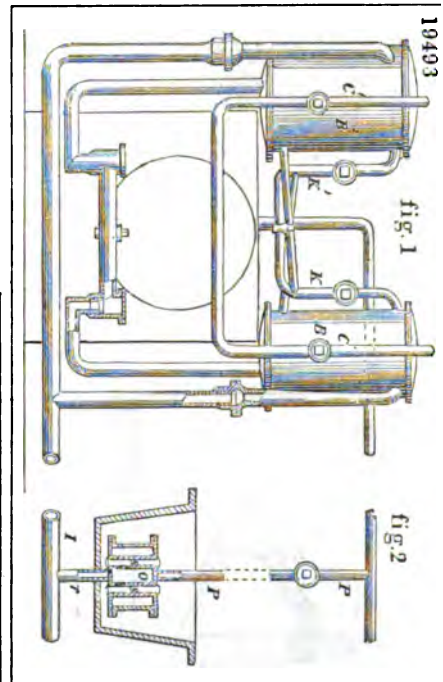
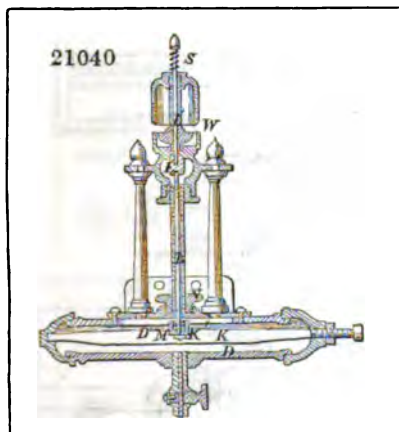
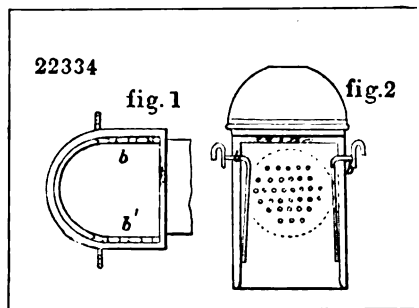
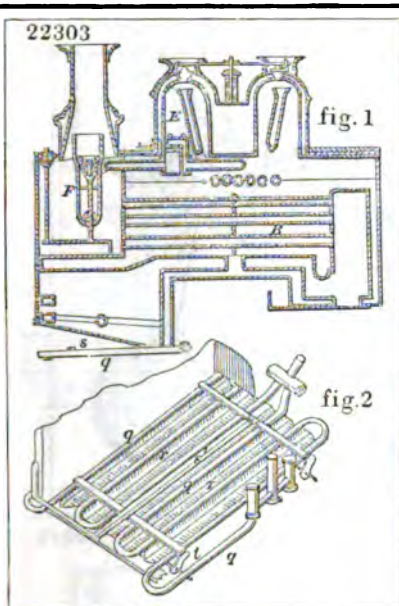


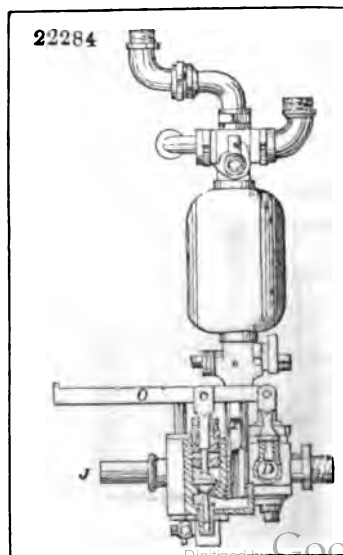
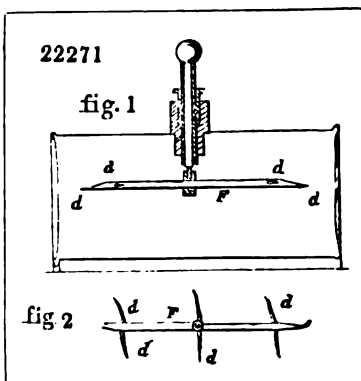
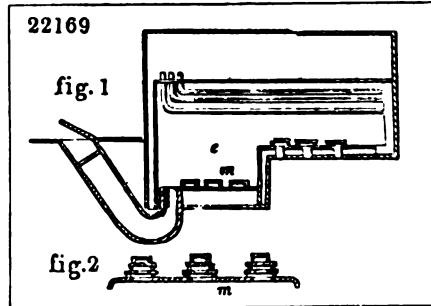
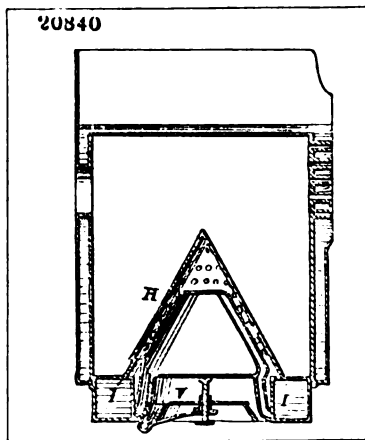
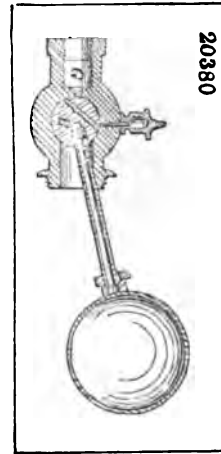
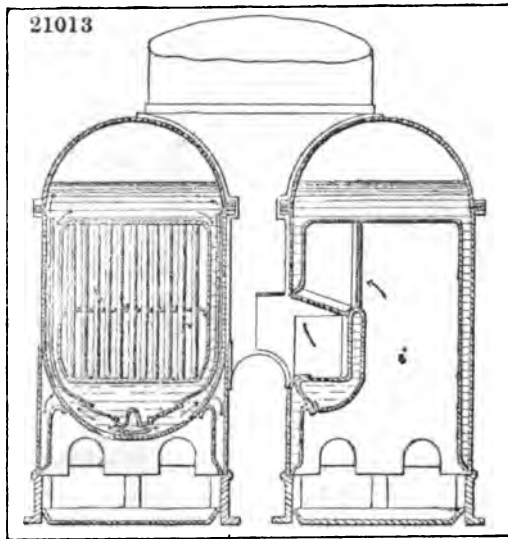
20167

fig. 1

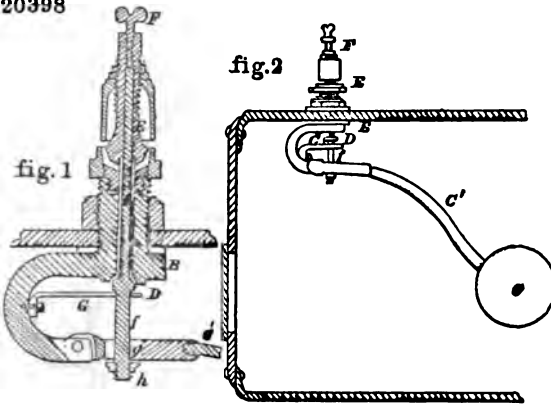
fig. 2



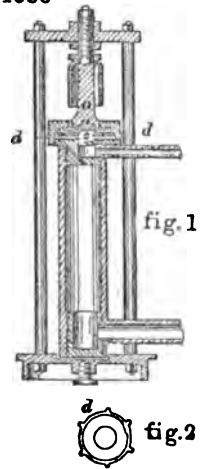




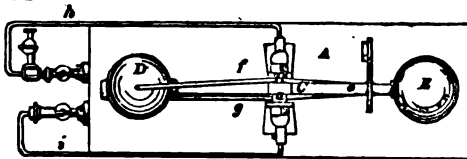
20398



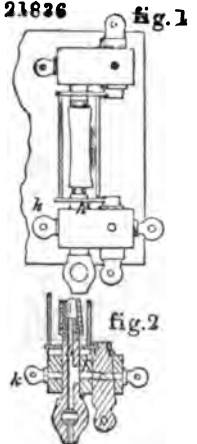
21686



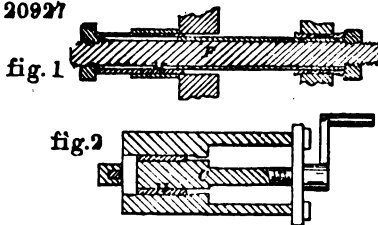
21991



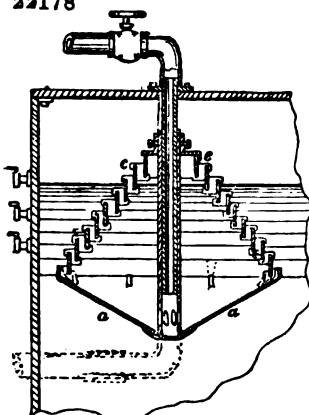
21826



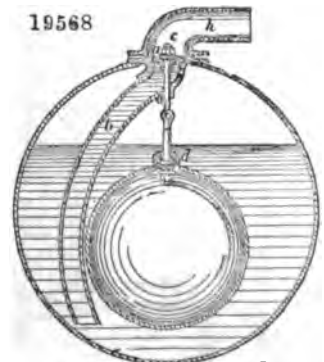
20927



22178



19568



20612

fig. 1

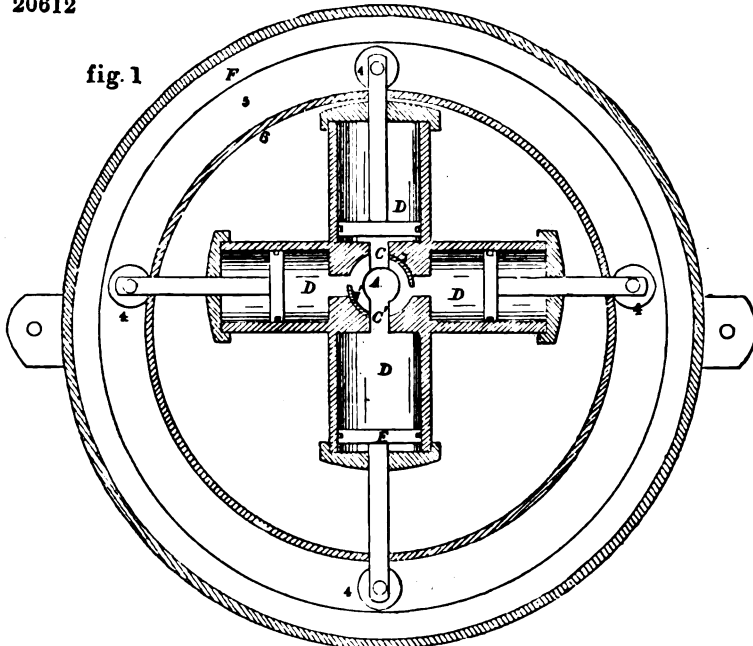


fig. 2

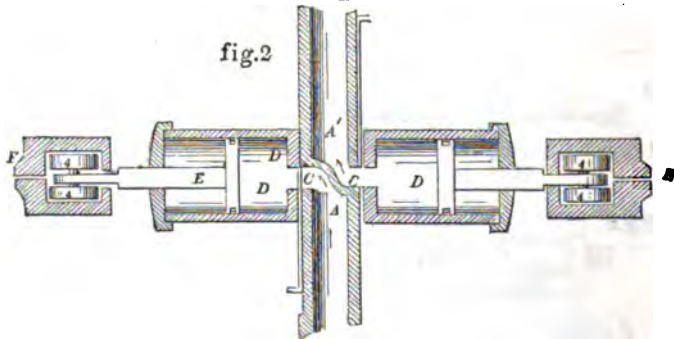
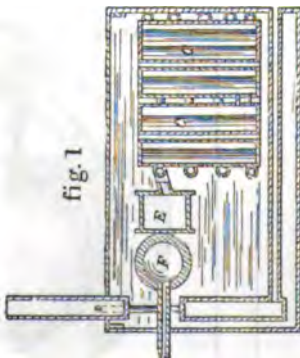
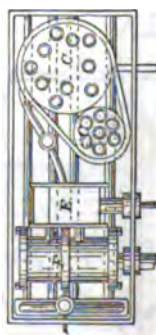


fig. 1



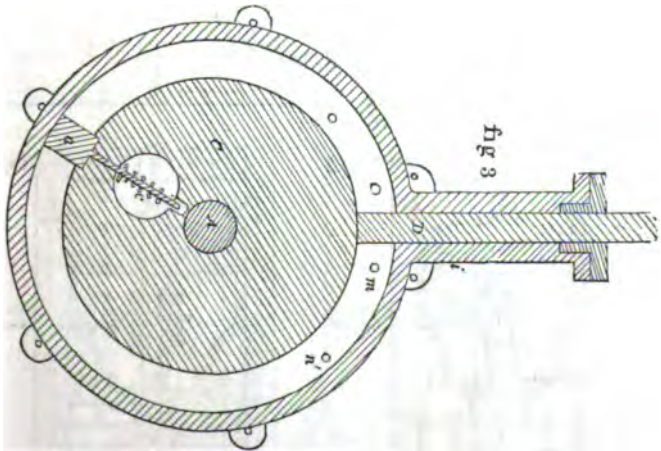
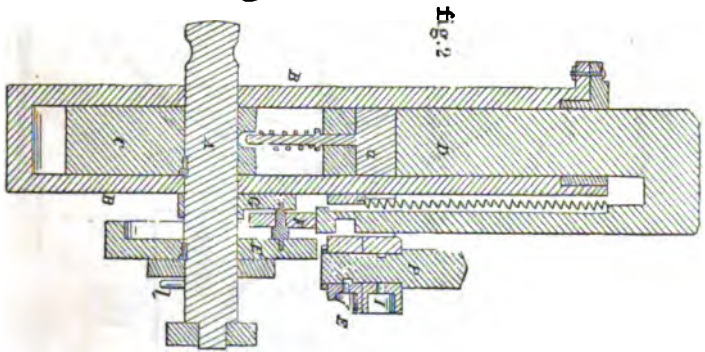
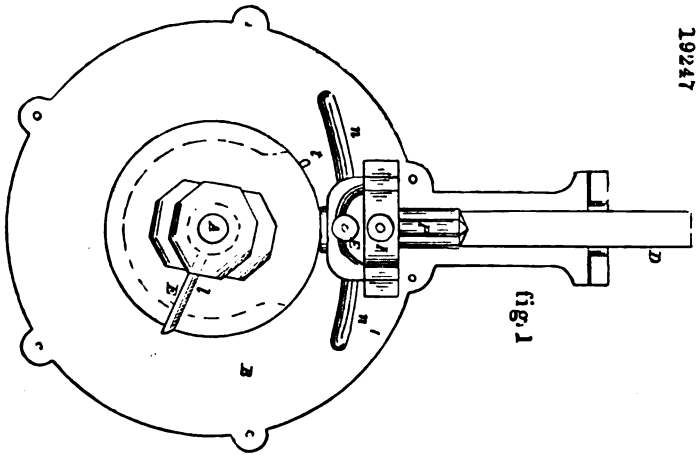
20172

fig. 2



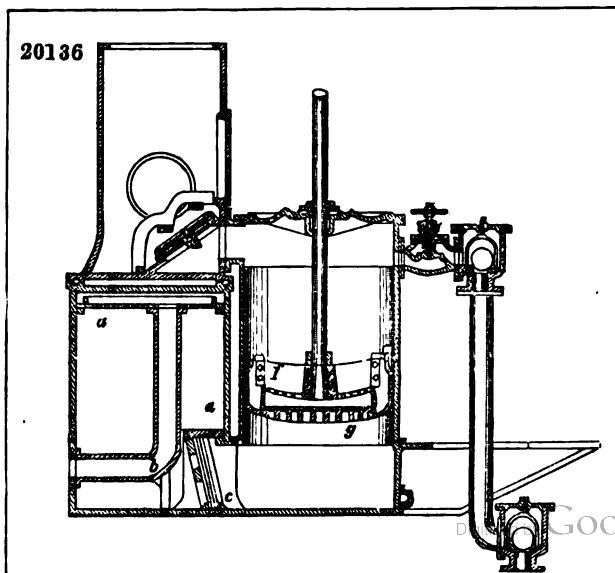
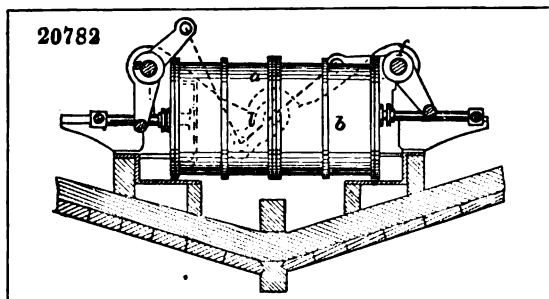
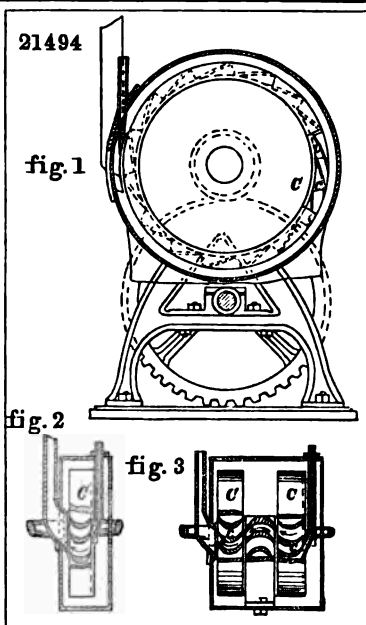
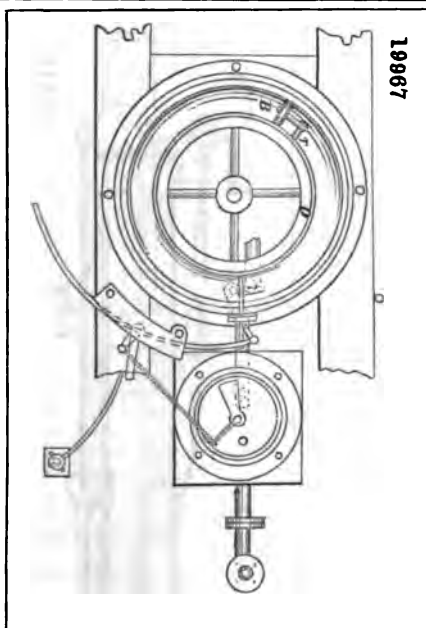


19247









21659

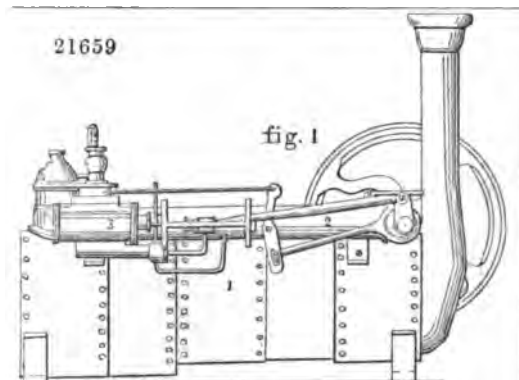
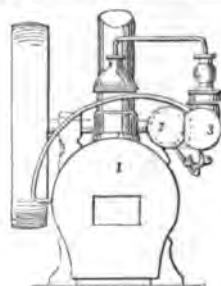


fig. 2



20533

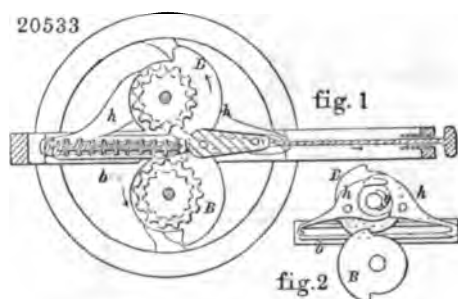
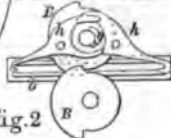
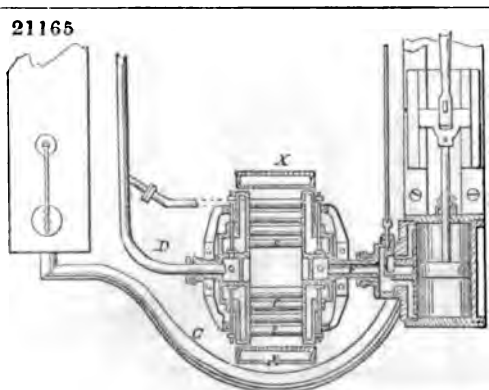


fig. 2



21165



21907

fig. 1

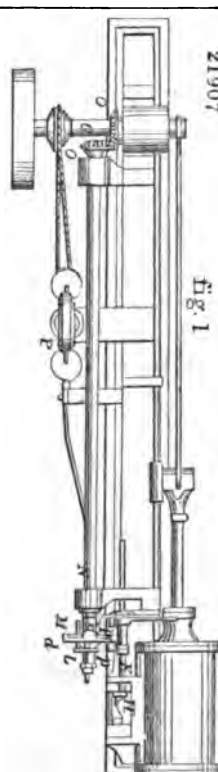


fig. 2

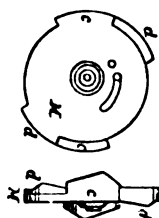
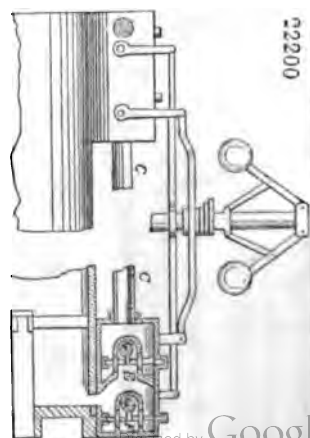
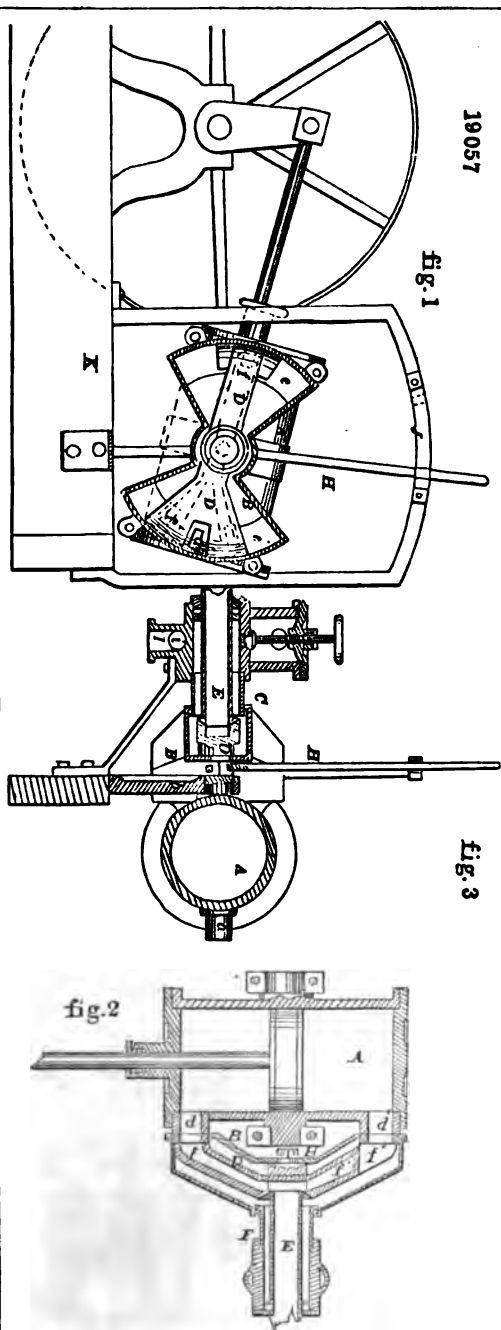
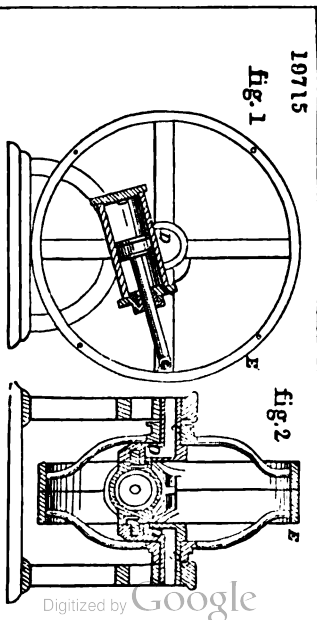
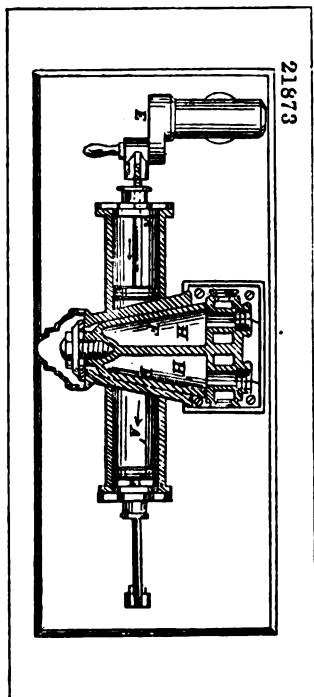


fig. 3



22200





19464

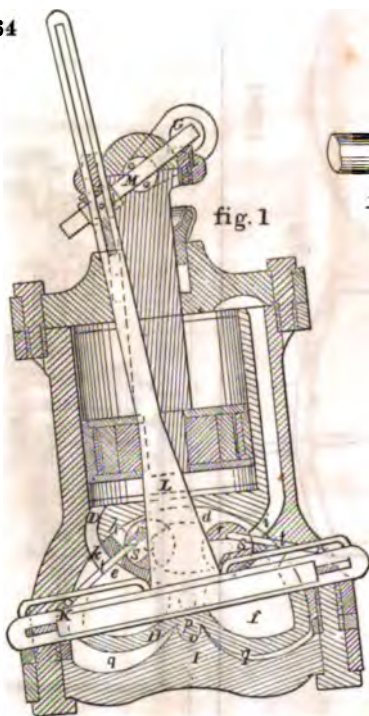
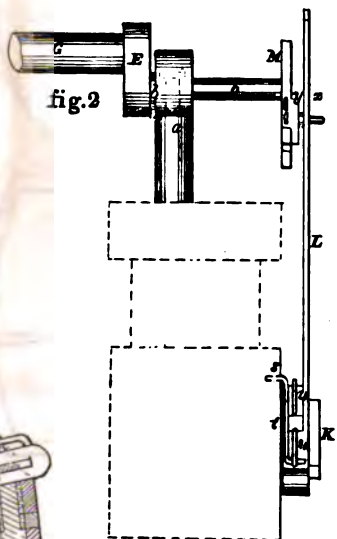
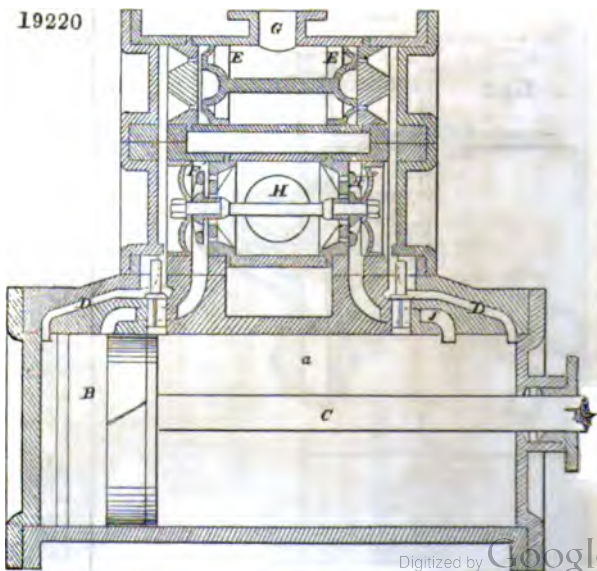


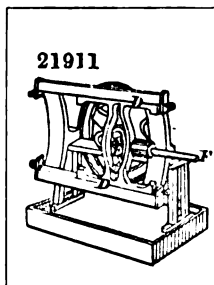
fig. 2

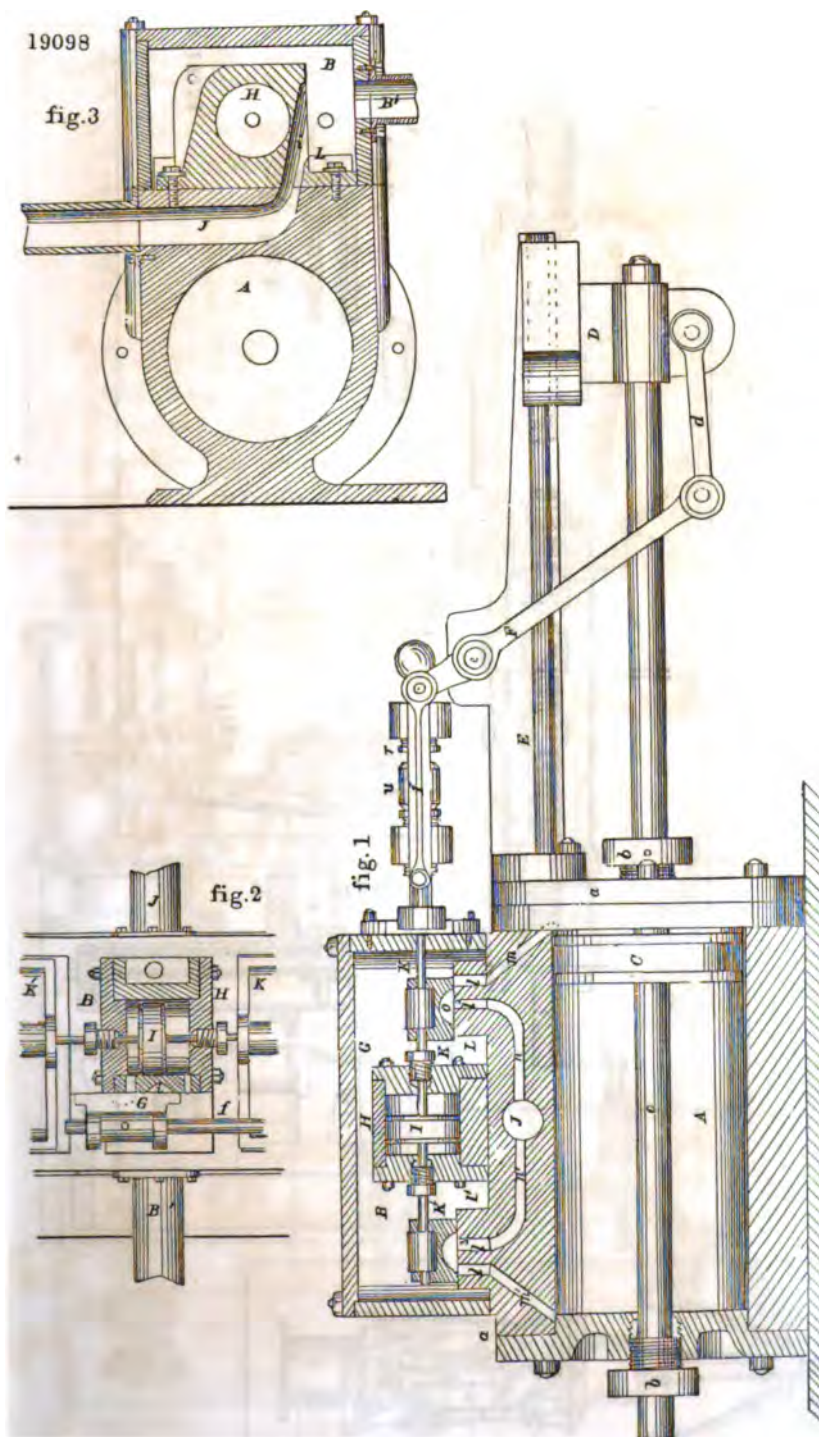


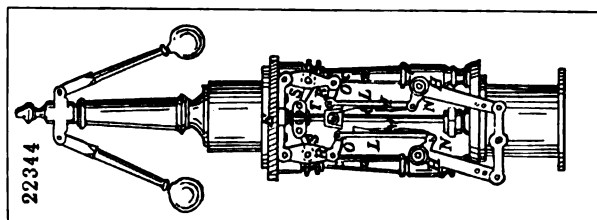
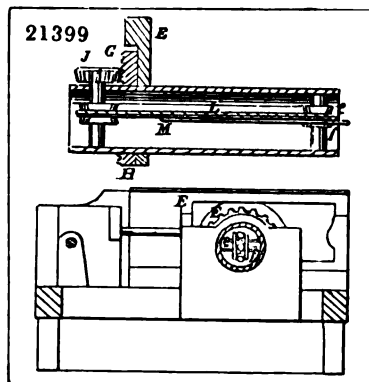
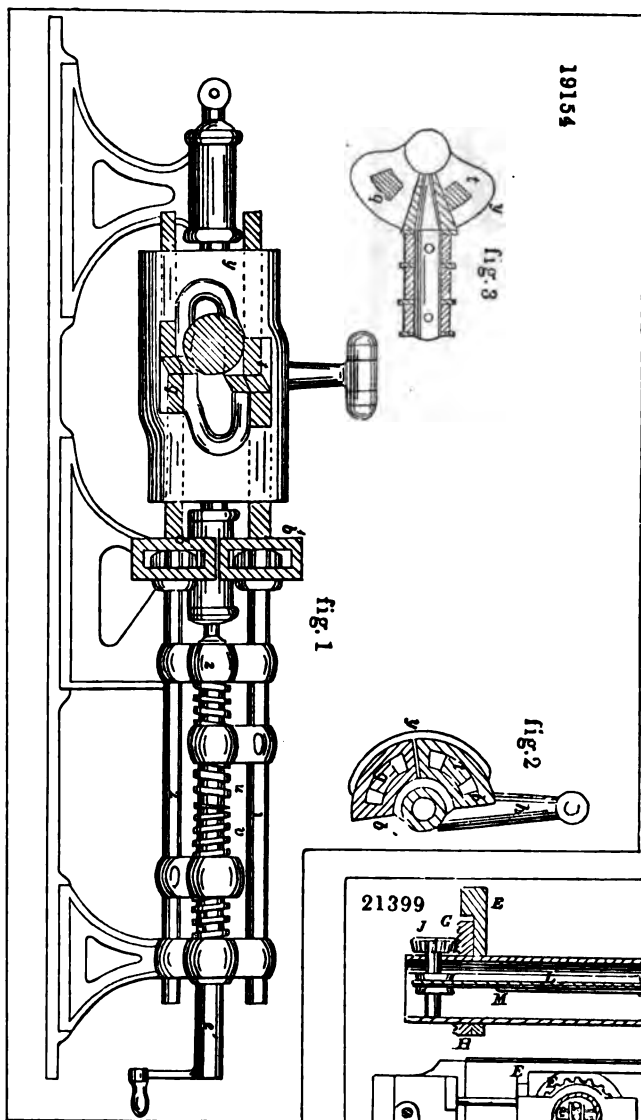
19220



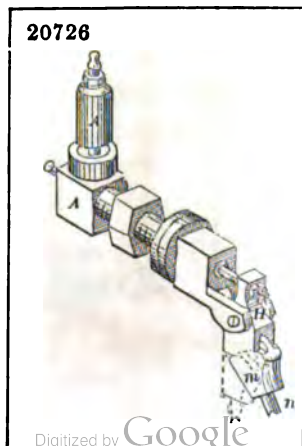
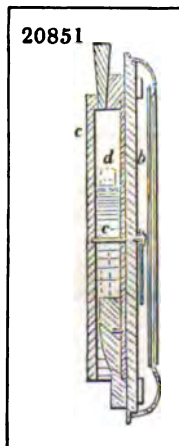
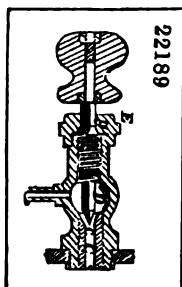
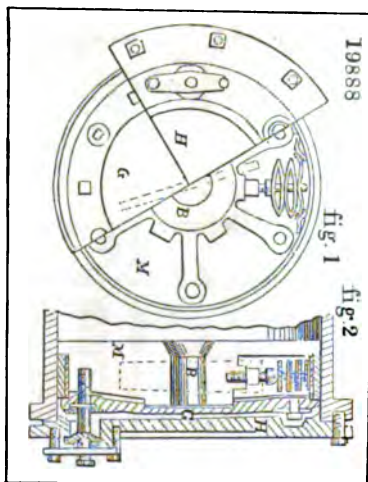
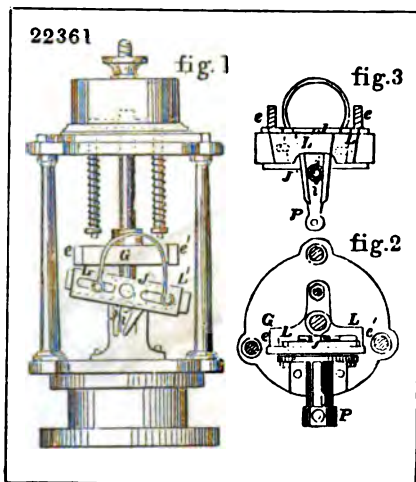
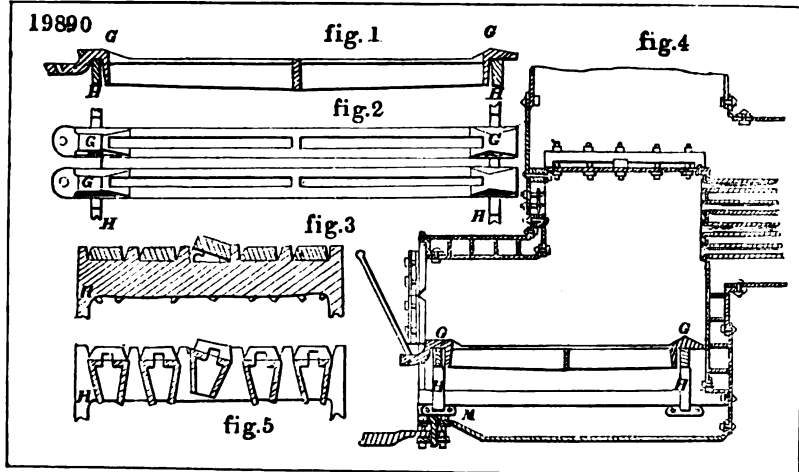
21911













19134

fig. 1

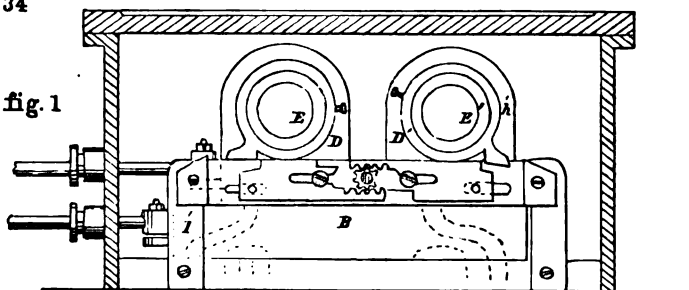


fig. 2

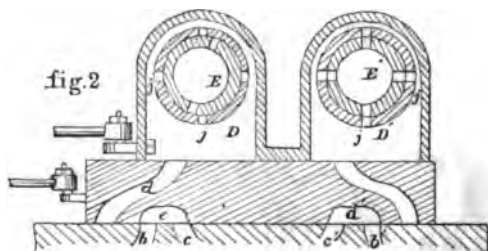


fig. 3

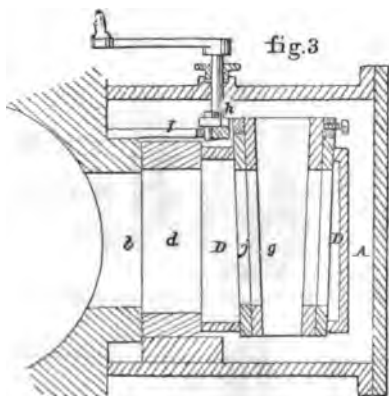


fig. 4

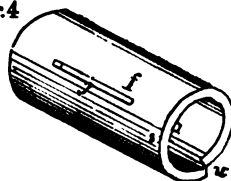
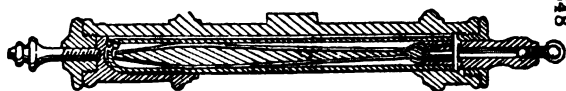


fig. 5



20848

19400

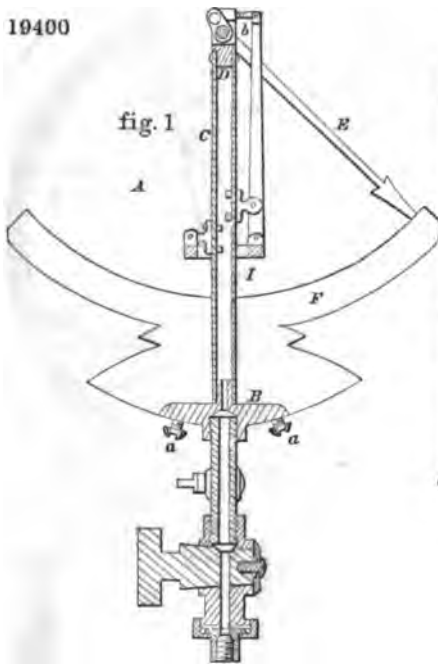
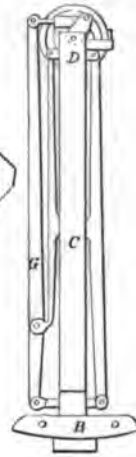
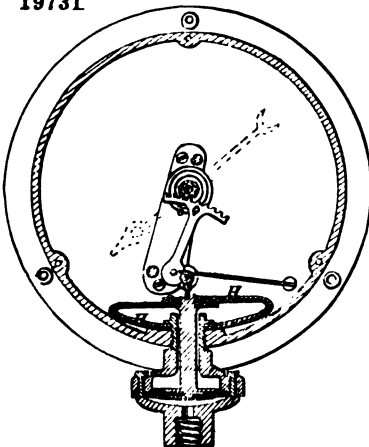


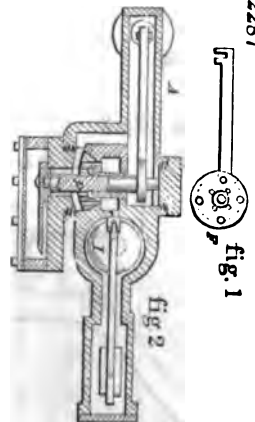
fig. 2



19731



22287



19177

fig. 1

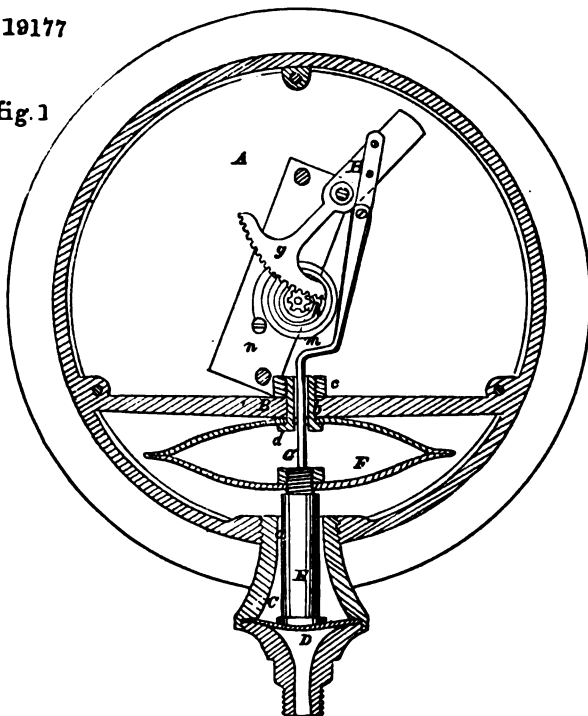
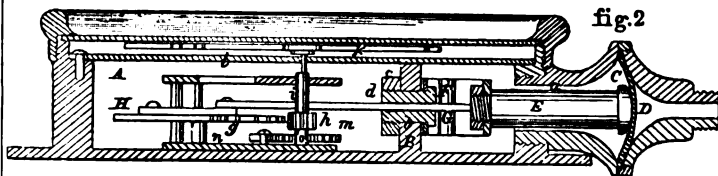
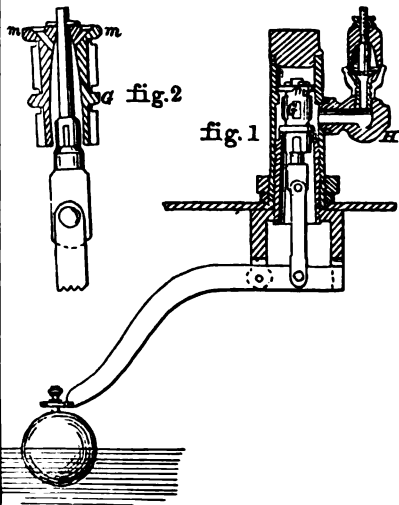


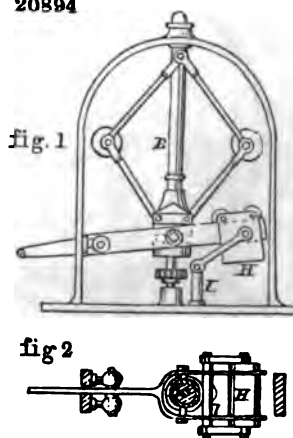
fig. 2

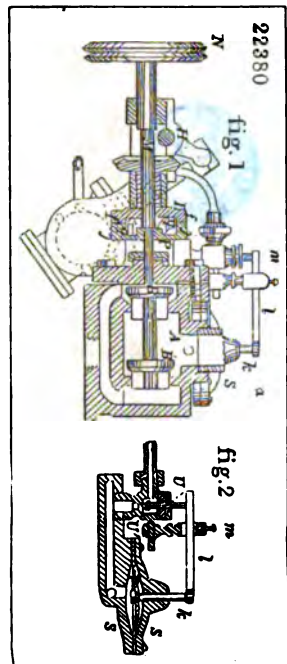
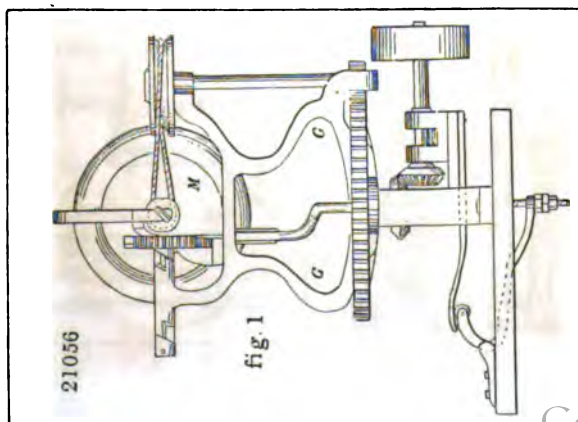
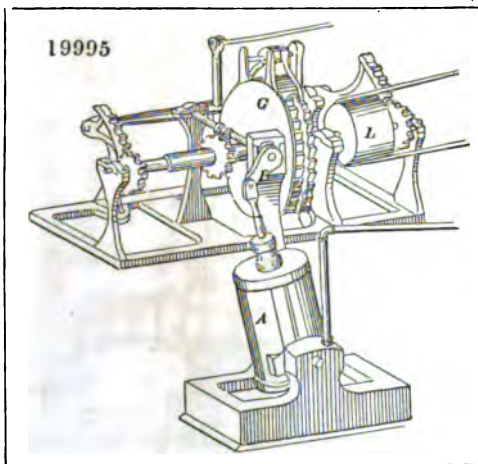
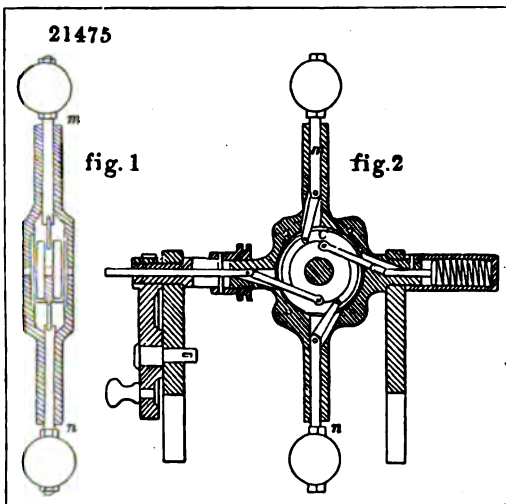


22313

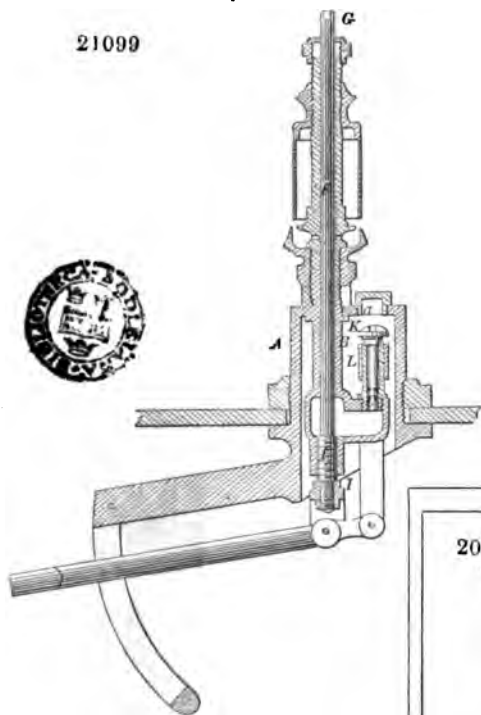


20894





21099



22439

fig. 1

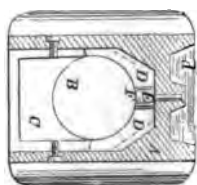
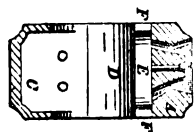


fig. 2



20115

fig. 1

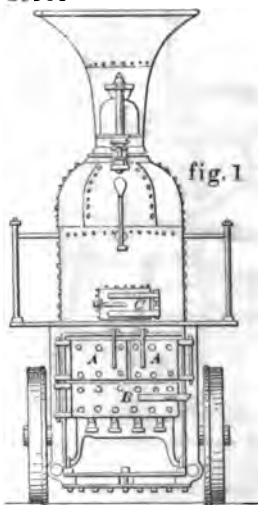
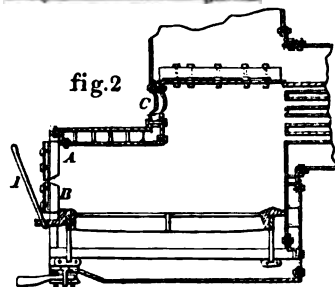


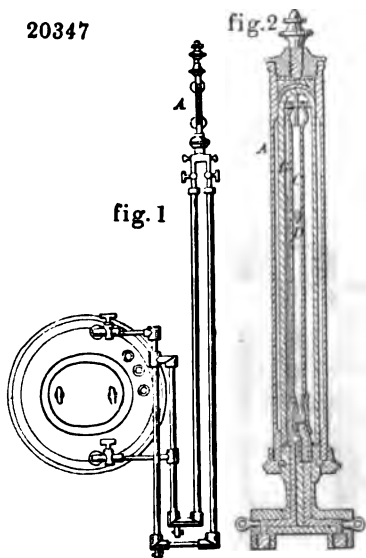
fig. 2

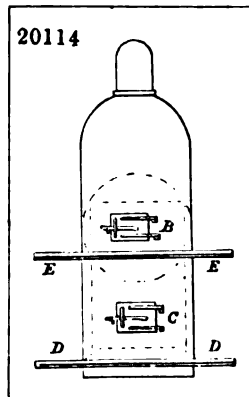
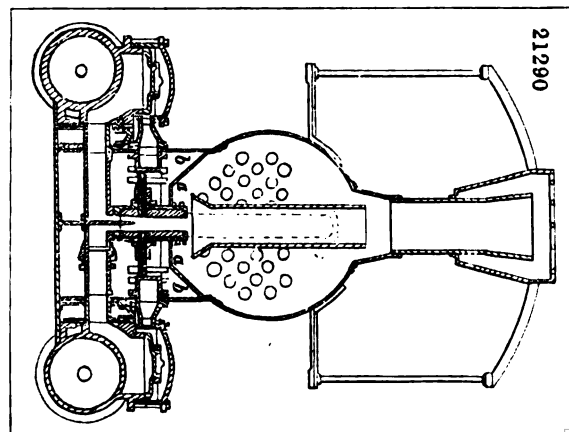
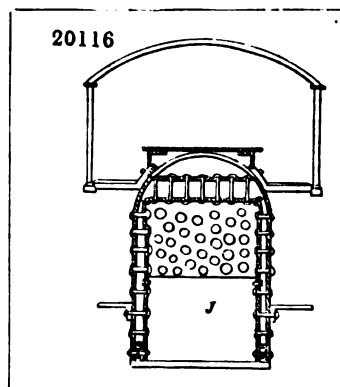
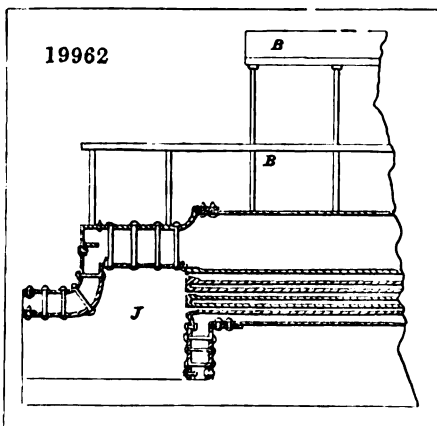
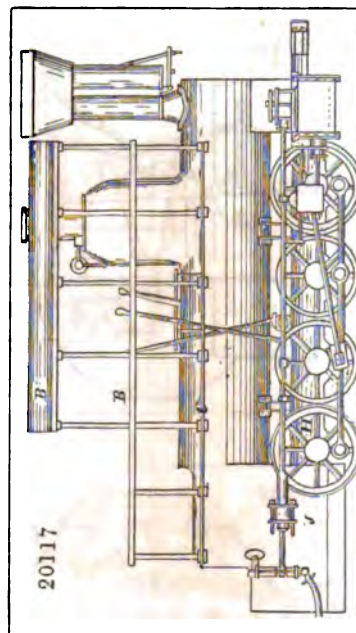
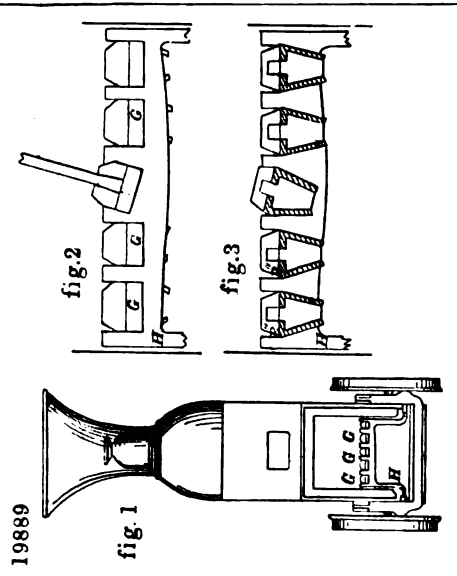


20347

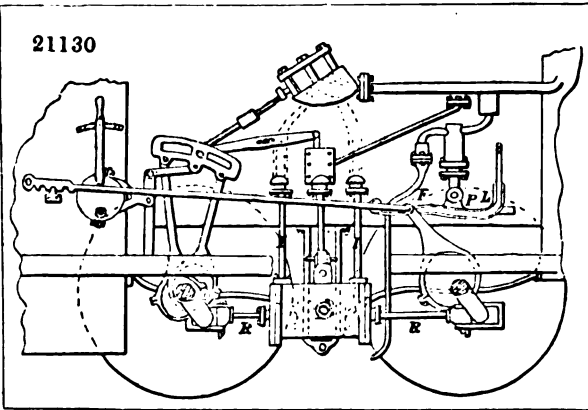
fig. 2

fig. 1

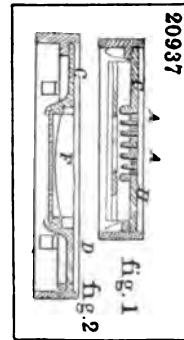




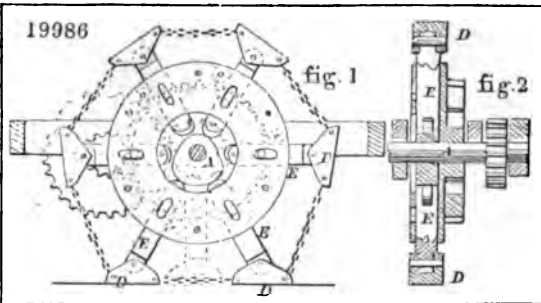
21130



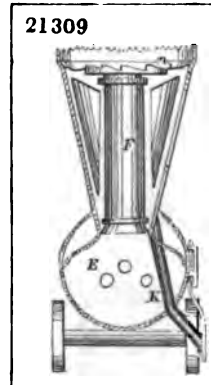
20937



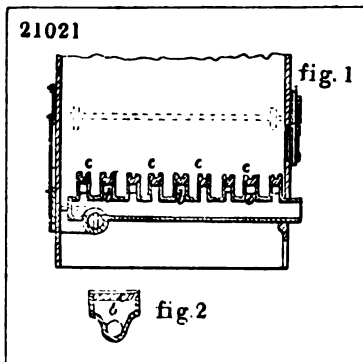
19986



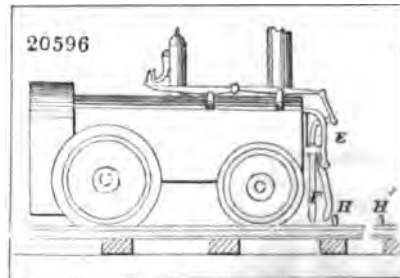
21309



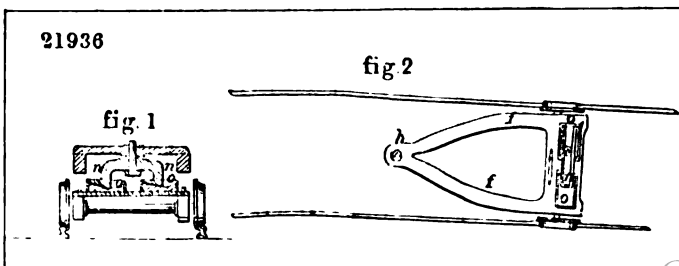
21021



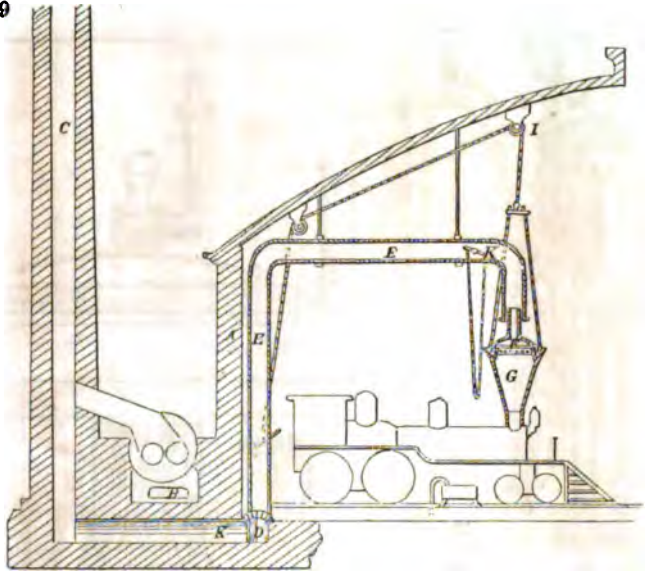
20596



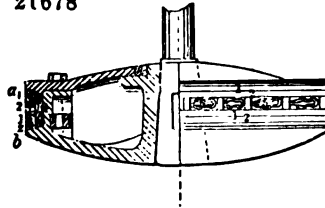
21936



19469



21678



19468

fig. 1

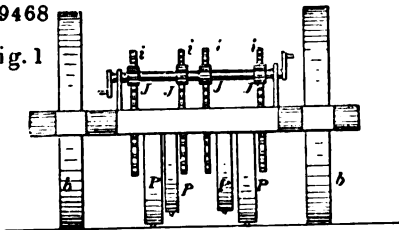
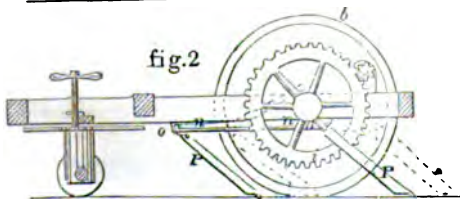
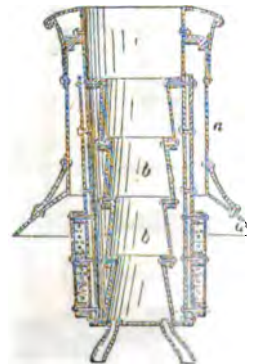


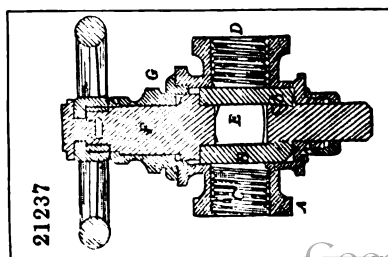
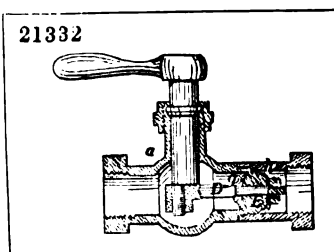
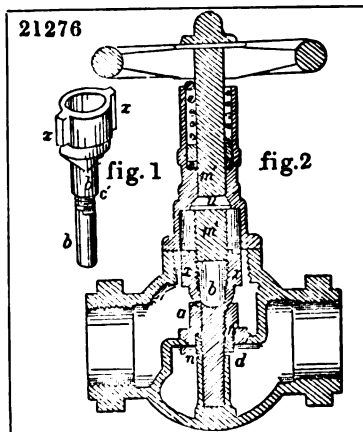
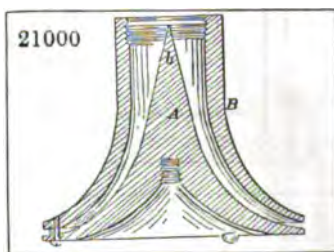
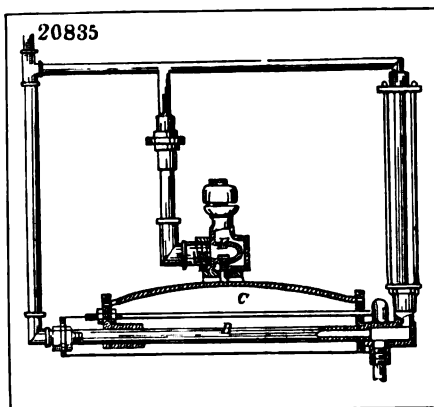
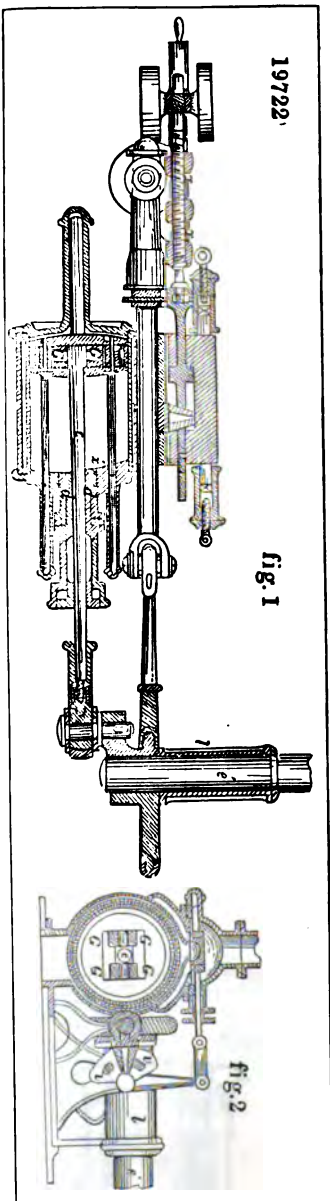
fig. 2

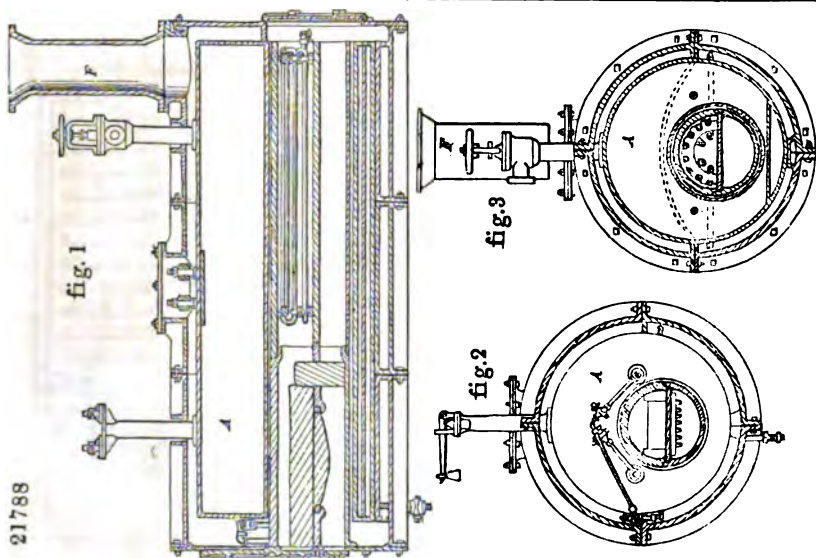


21687

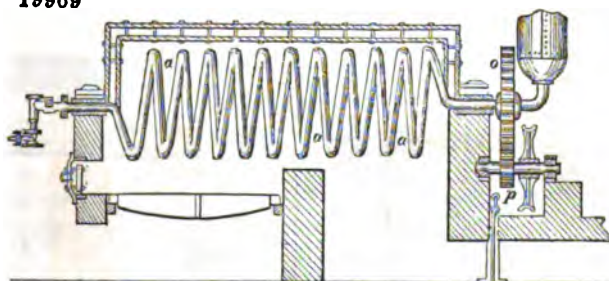




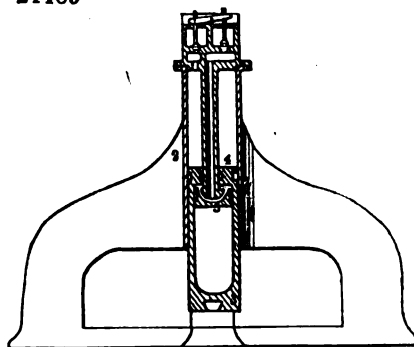




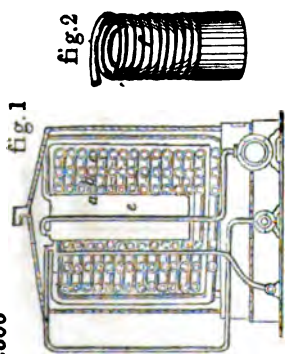
19969



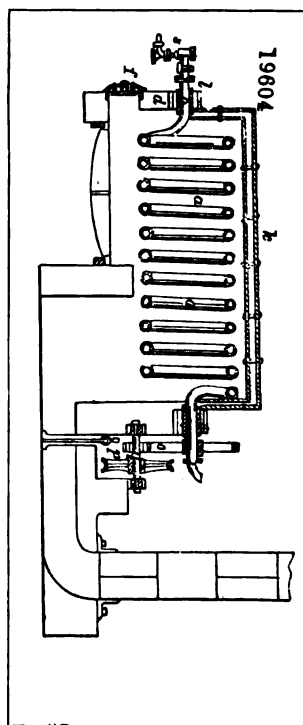
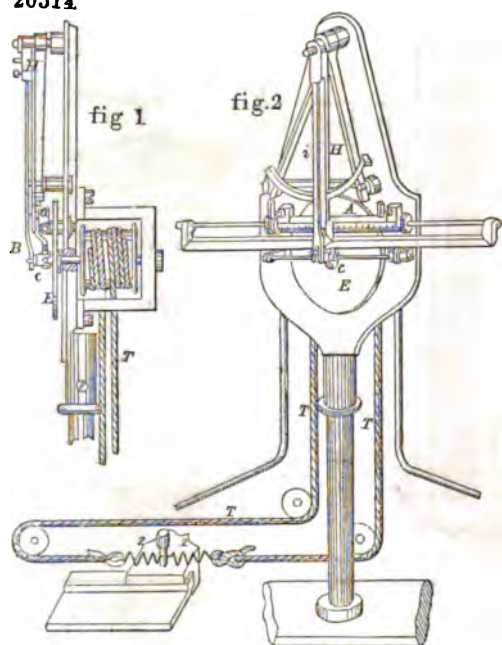
21489



22308

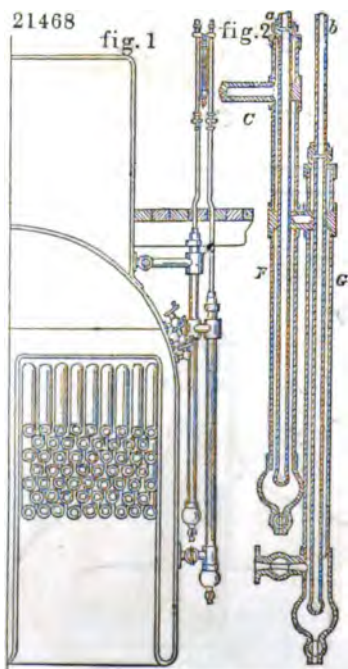


20514

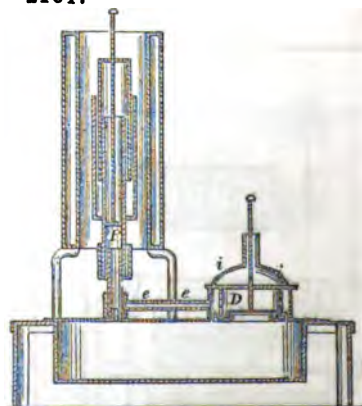


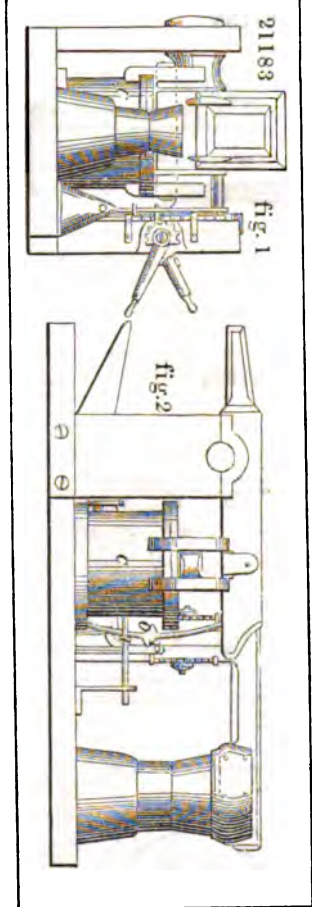
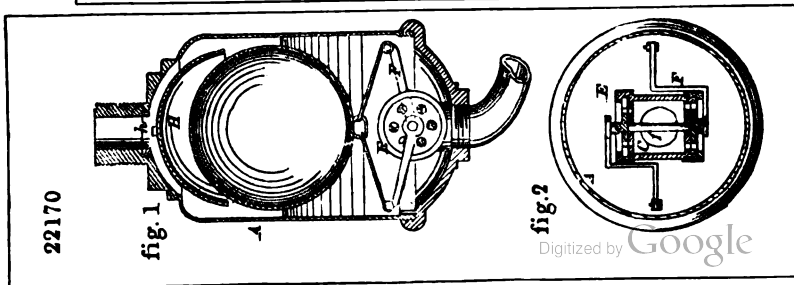
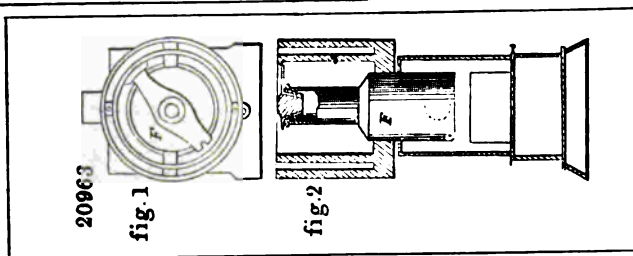
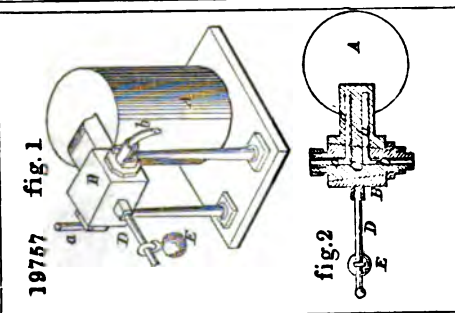
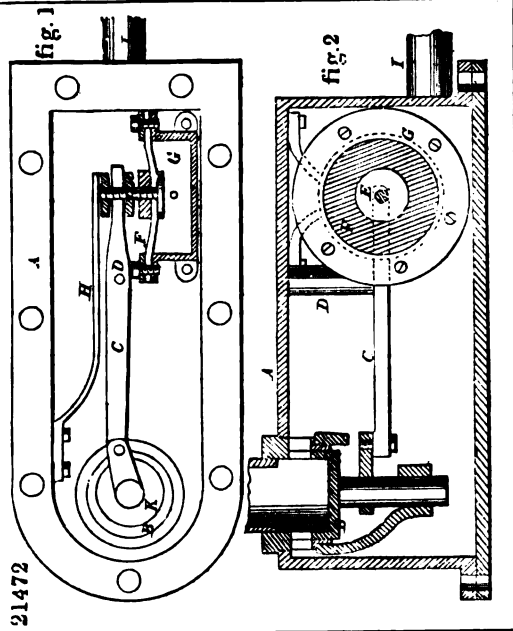
21468

fig. 1



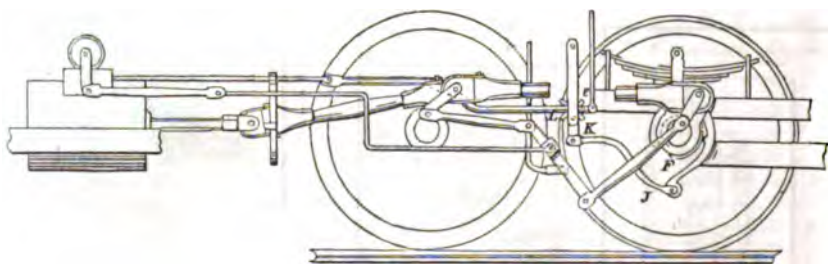
21047



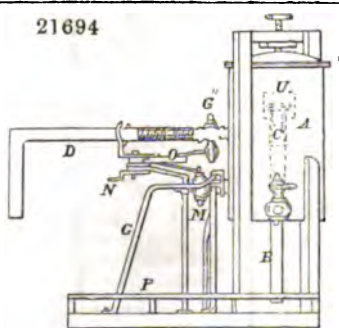




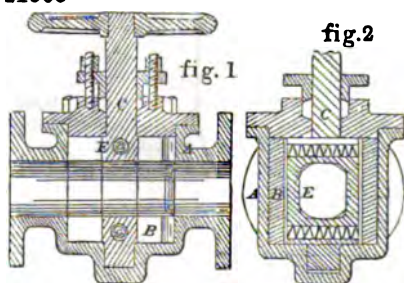
22198



21694



**21366**



19594

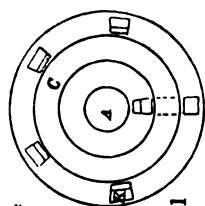
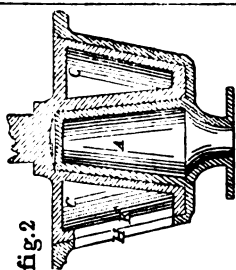


fig. 1



### fig. 2

21579

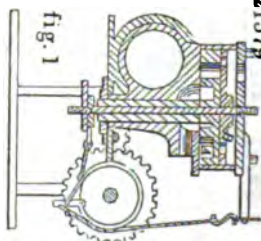
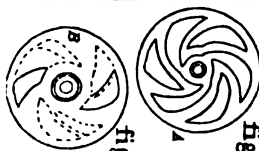


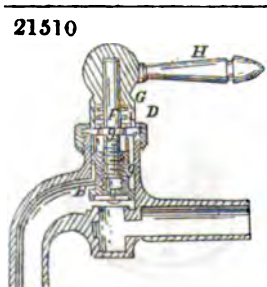
fig.



### Fig. 2

Fig. 3

21510



21524

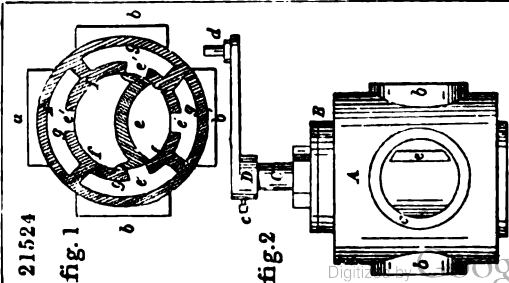


Fig. 1

## Bü.2

22321

fig. 1

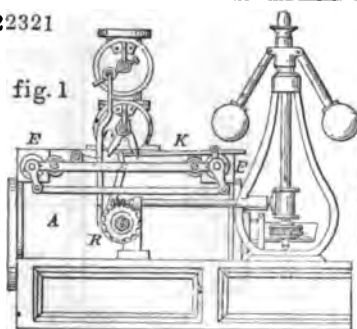
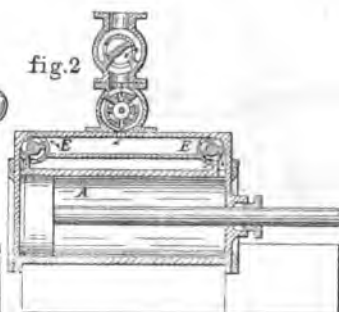
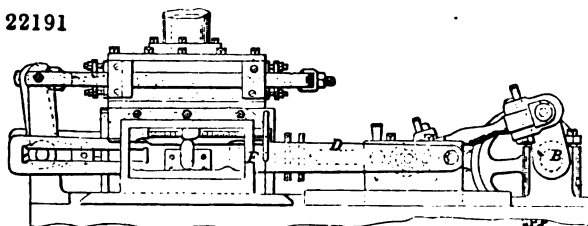


fig. 2



22191



22333

fig. 2

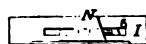
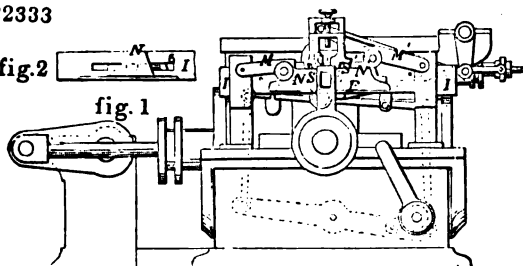


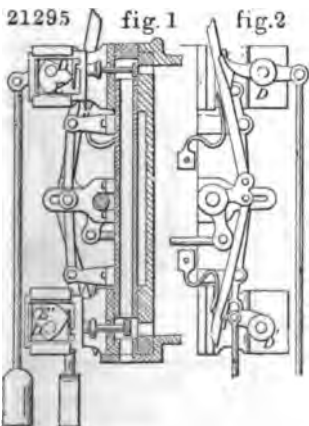
fig. 1



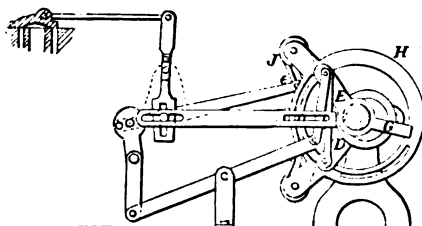
21295

fig. 1

fig. 2



22318



19443

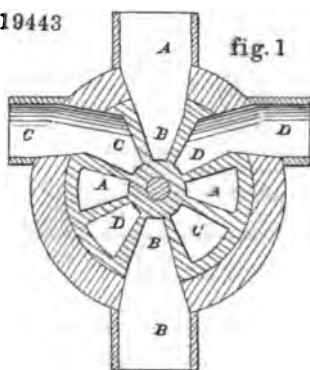


fig. 1

fig. 2

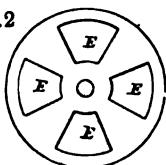
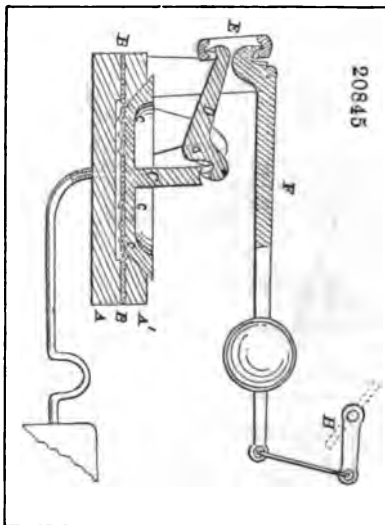
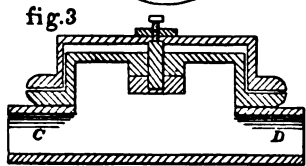
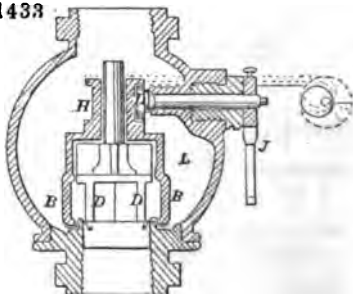


fig. 3



20845

21433



20768

fig. 1

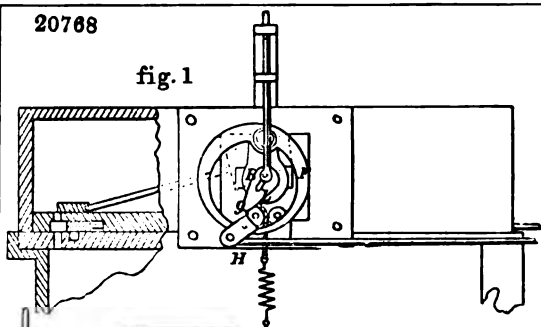
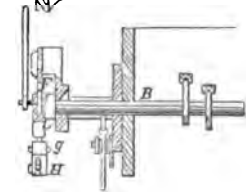
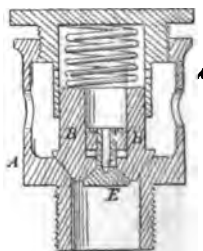
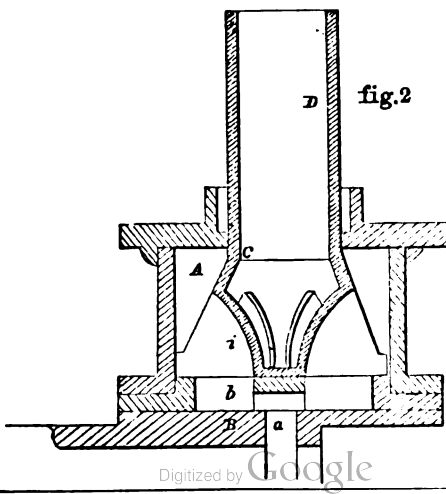
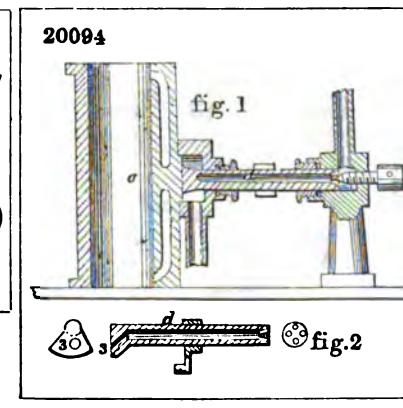
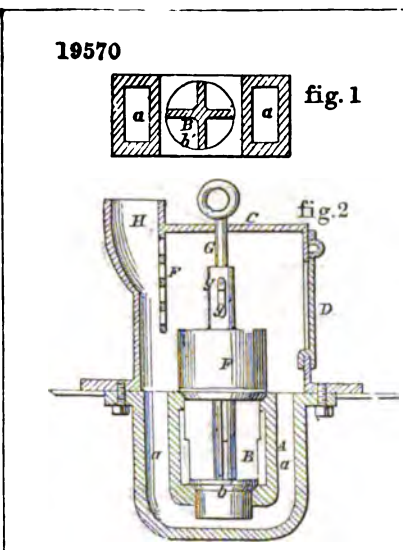
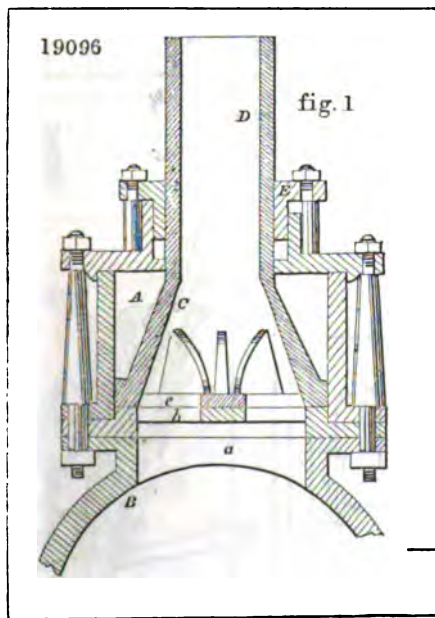
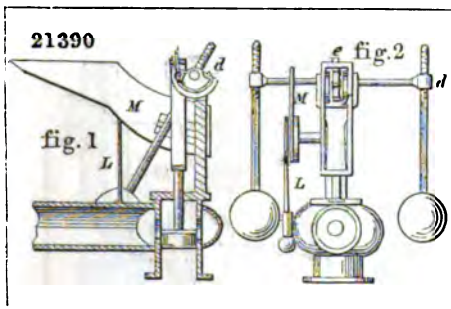
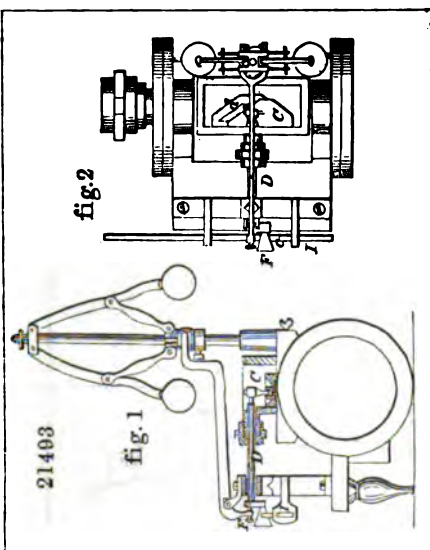


fig. 2



21535







19484

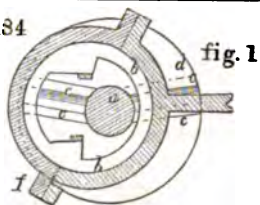


fig. 1

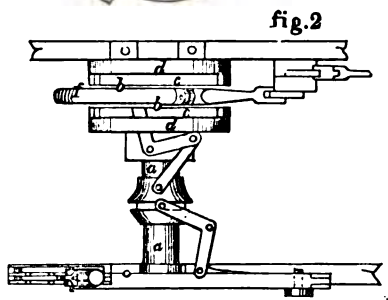


fig. 2

21151

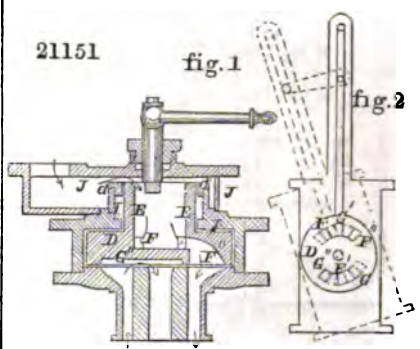
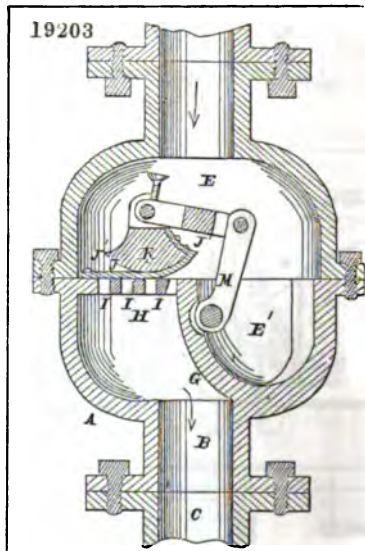


fig. 1

fig. 2

19203



21235

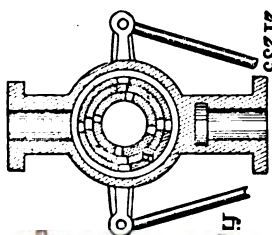


fig. 1

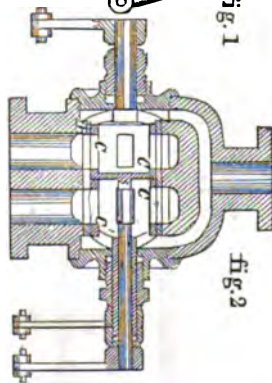


fig. 2

21155

fig. 1

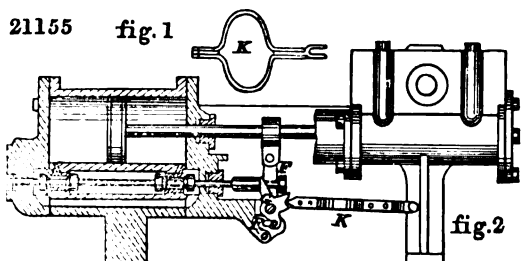
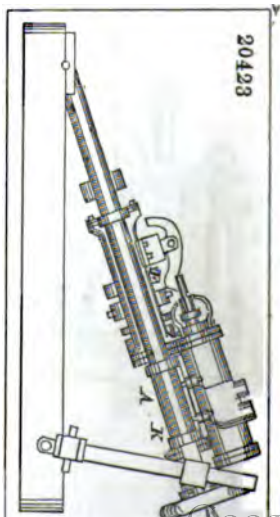
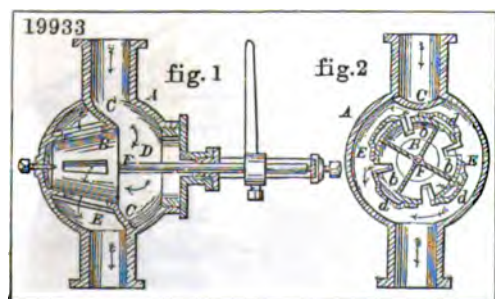
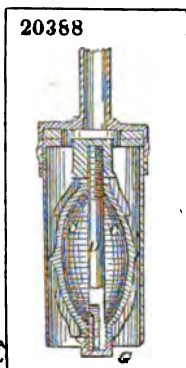
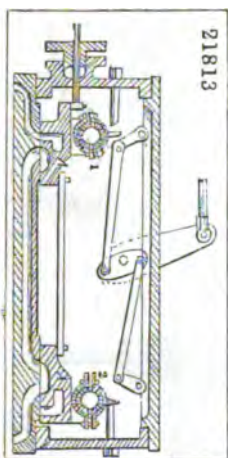
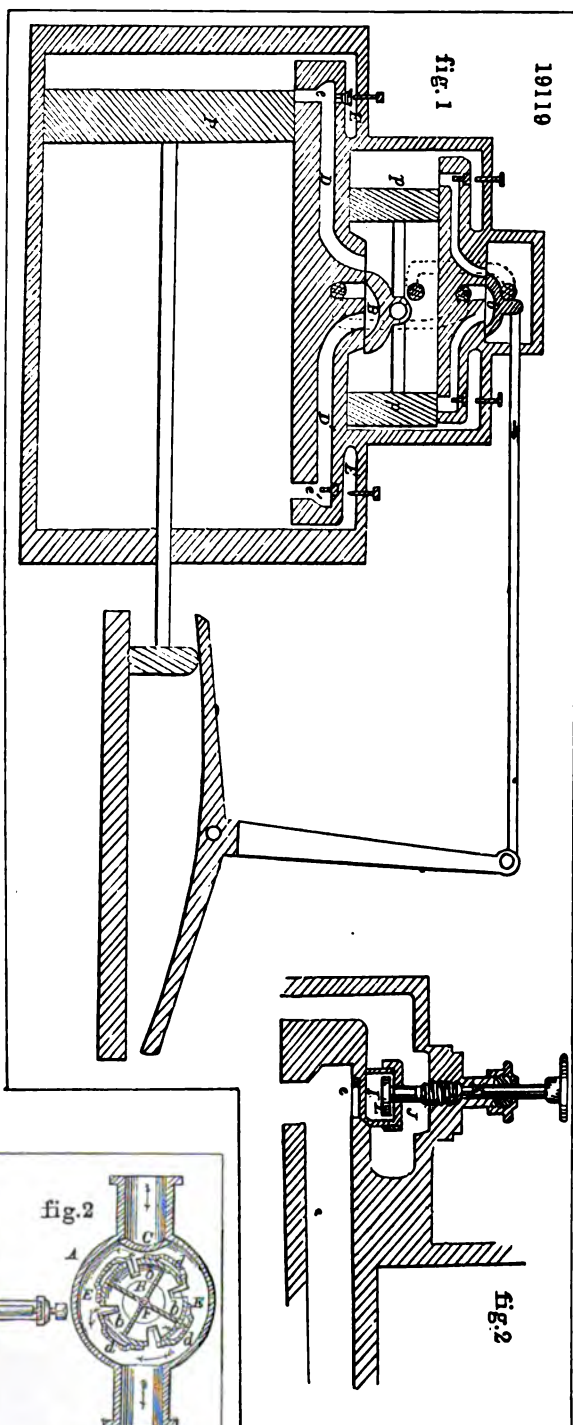
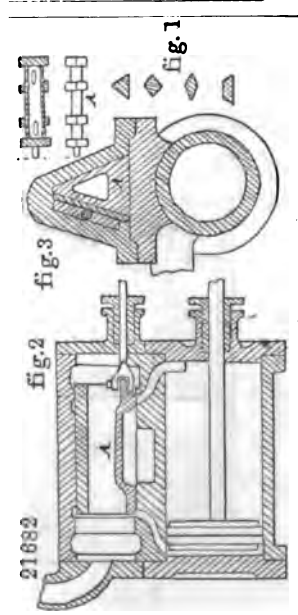
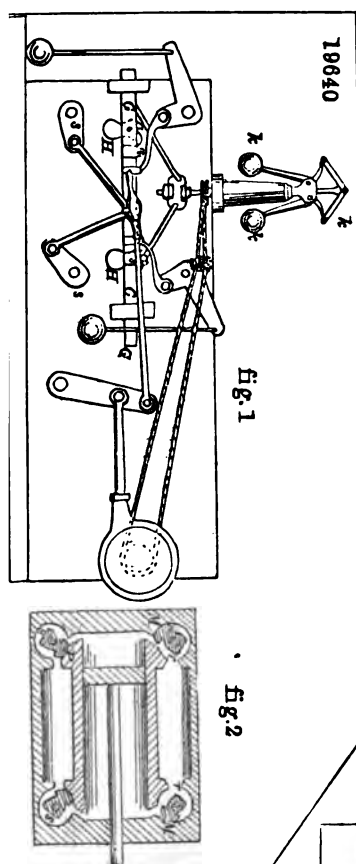
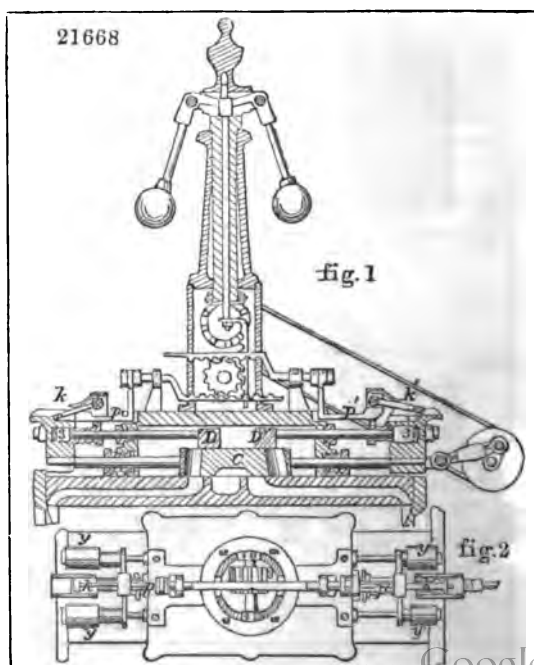
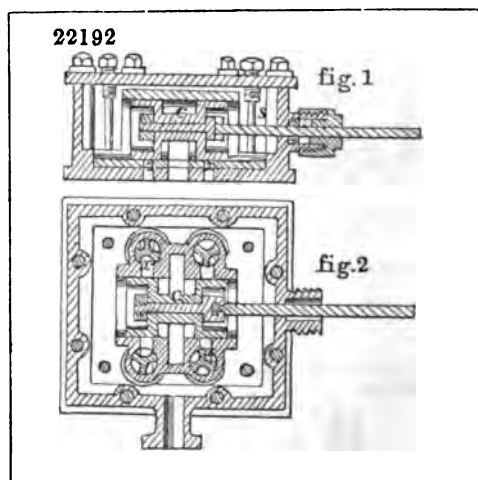
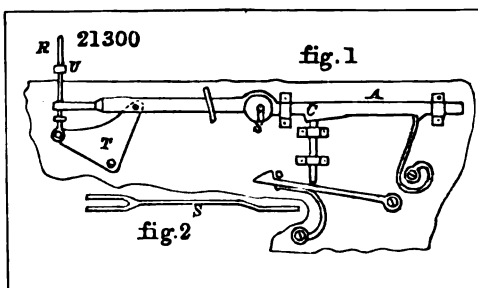


fig. 2

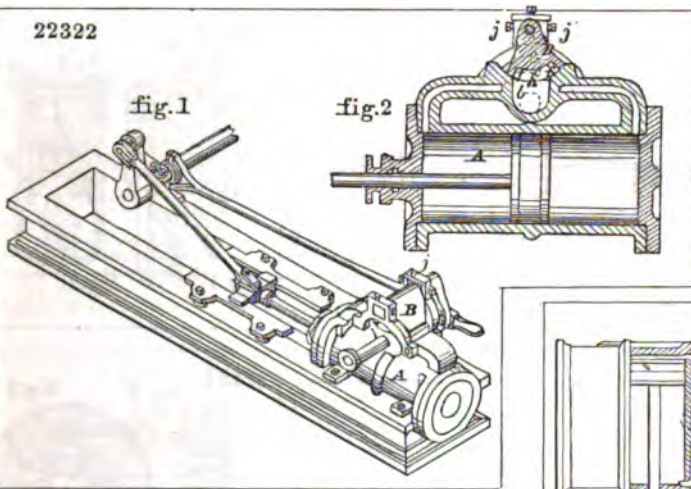
20423



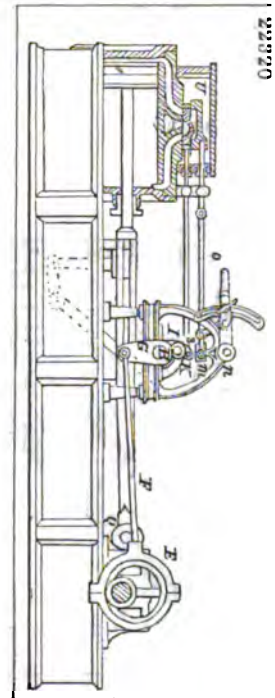
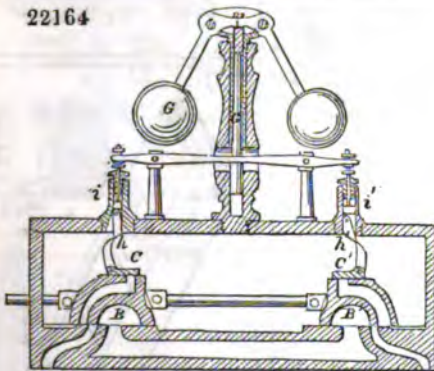




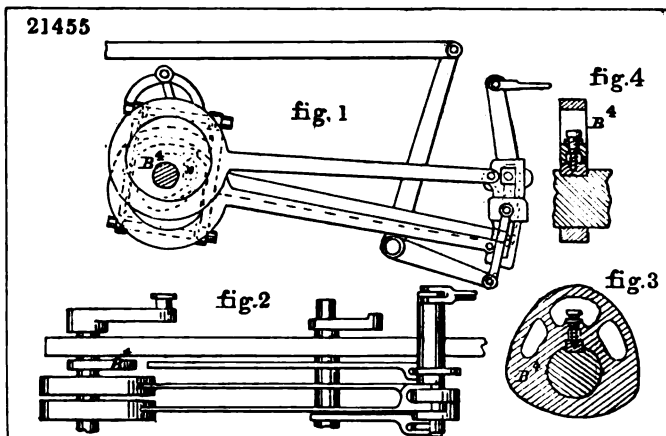
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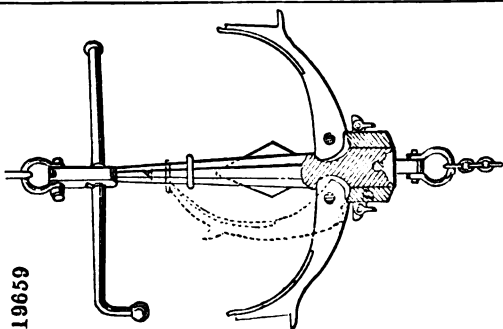


22164

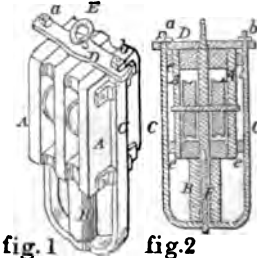


21455

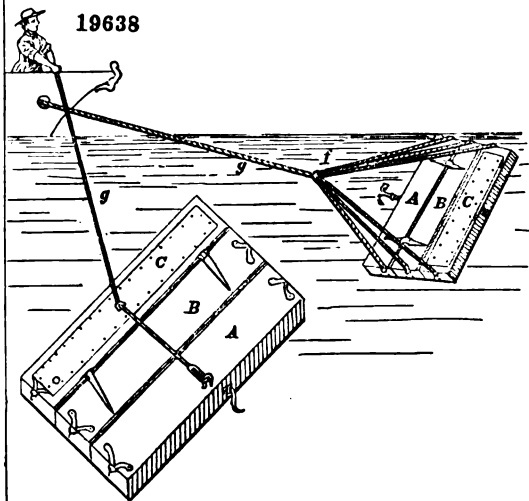




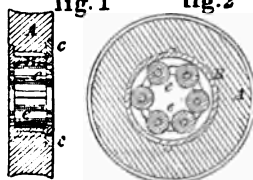
22432



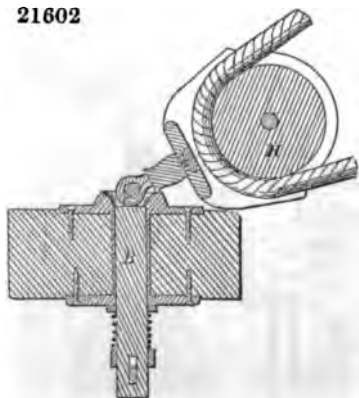
19638



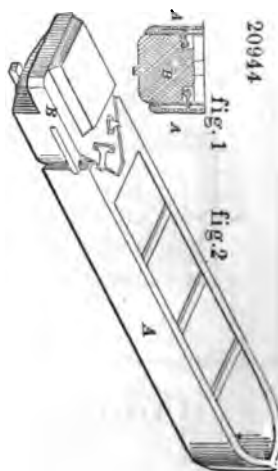
22154



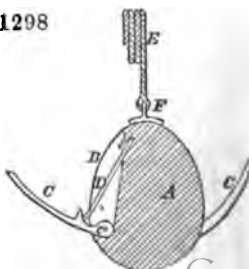
21602



20944



21298





19656

fig. 1

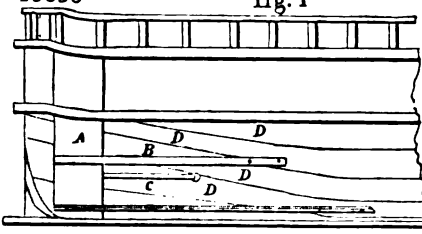
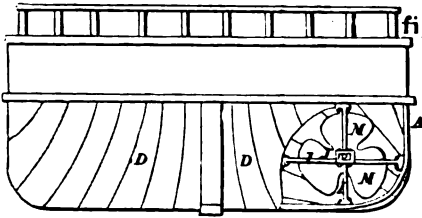


fig. 2



21572

fig. 1

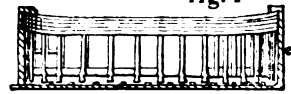
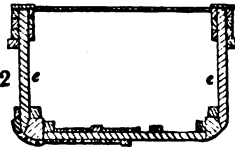
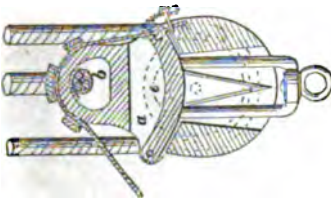


fig. 2



21979



19317

fig. 1



fig. 2

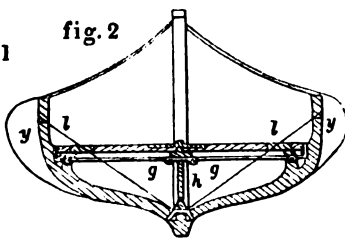


fig. 3



fig. 4

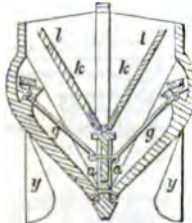
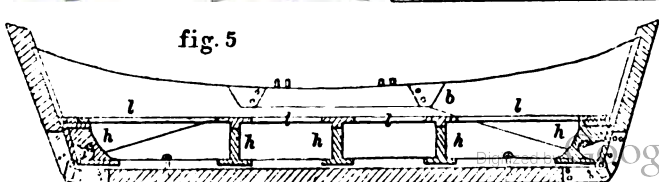


fig. 5



19693

fig. 1

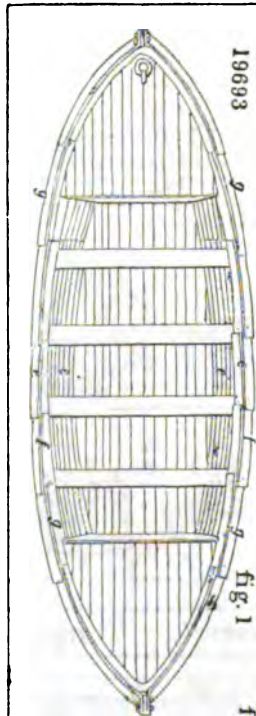
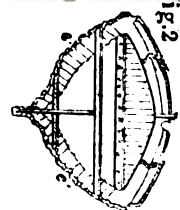
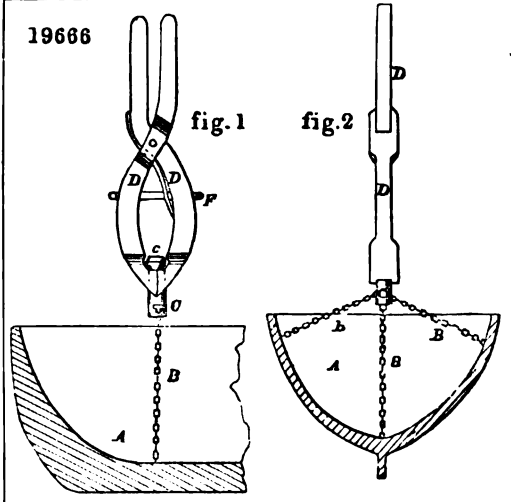


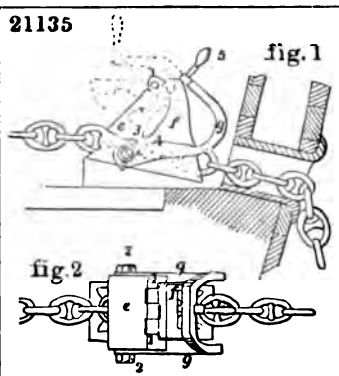
fig. 2



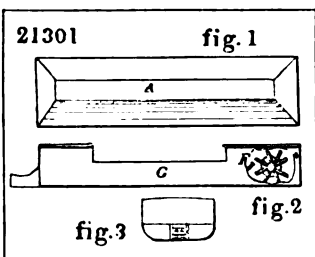
19666



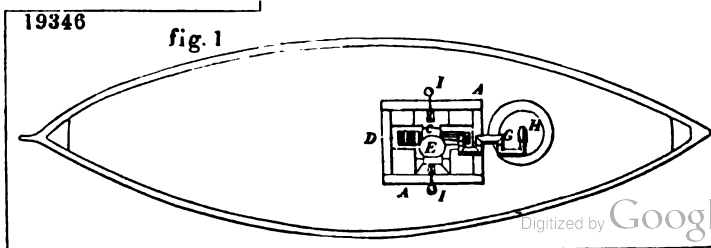
21135



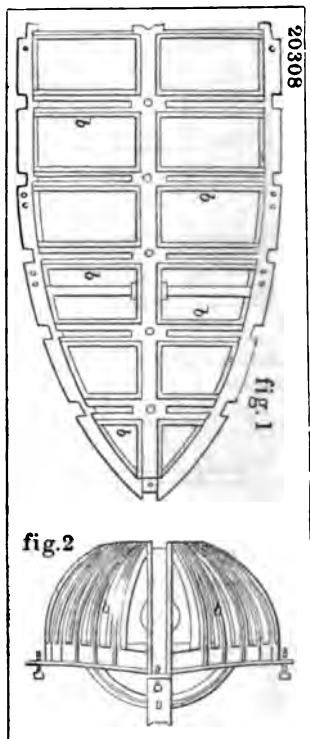
21301



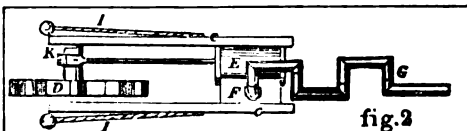
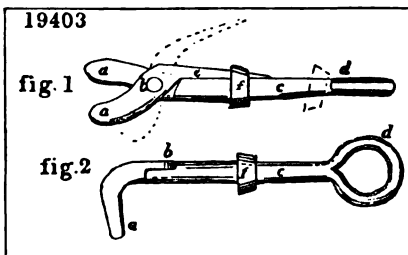
19346

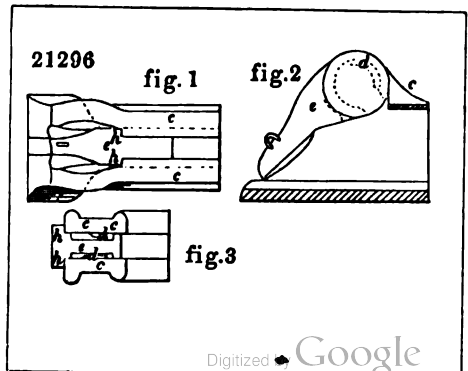
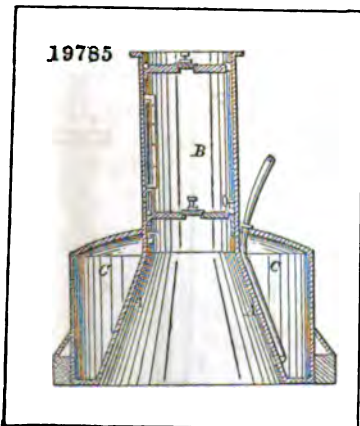
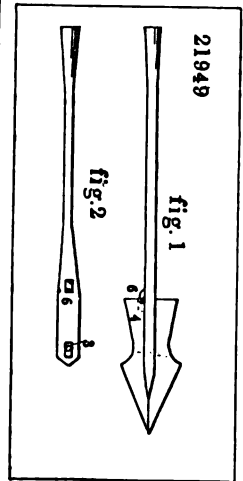
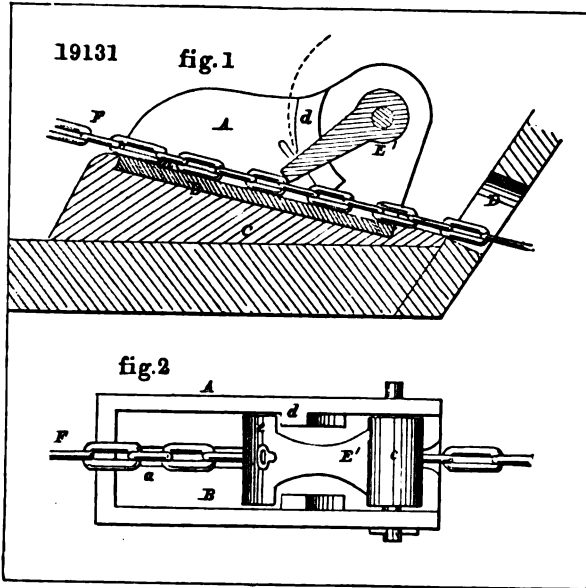
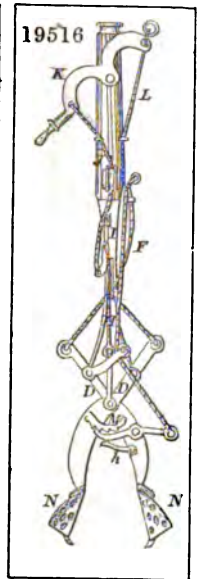
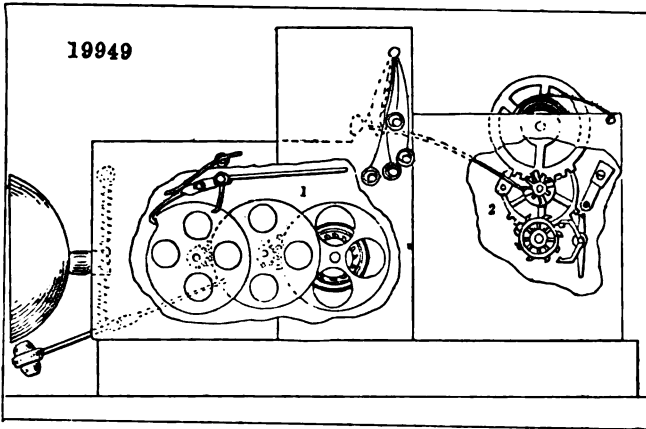


20308



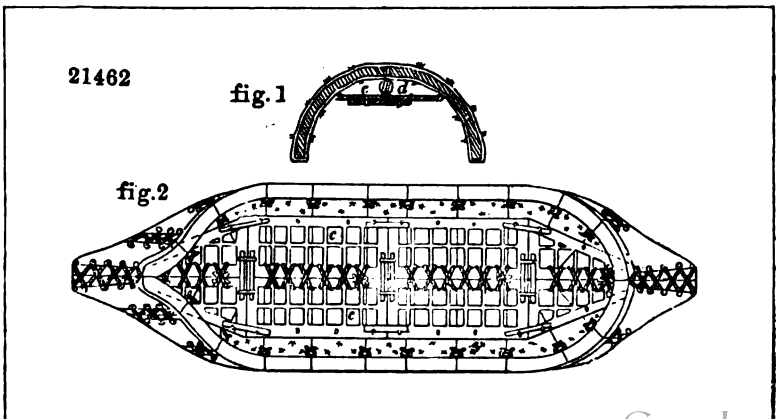
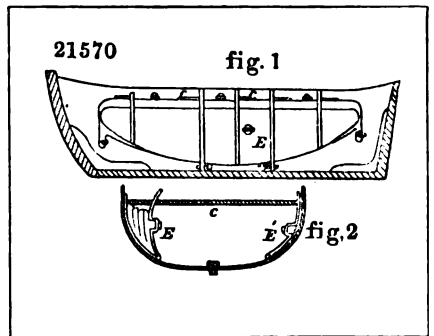
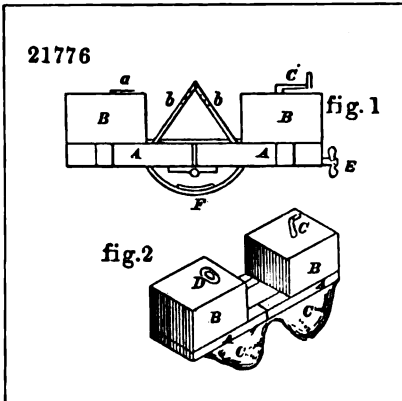
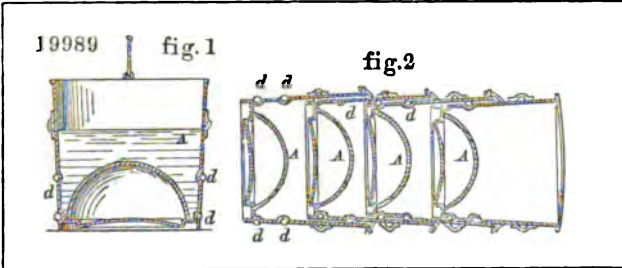
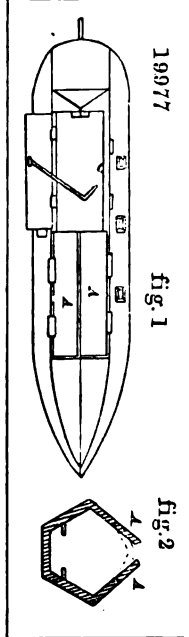
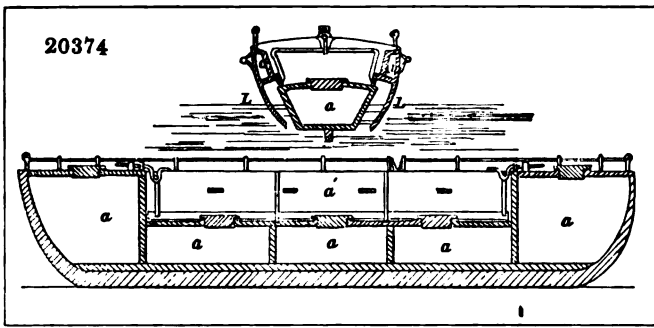
19403



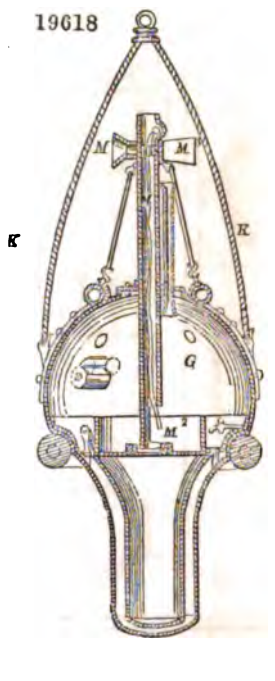




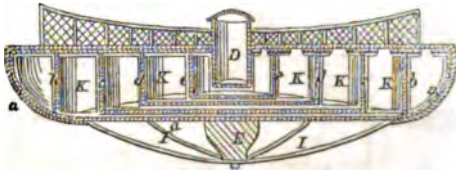




19618



19632



19593

fig. 1

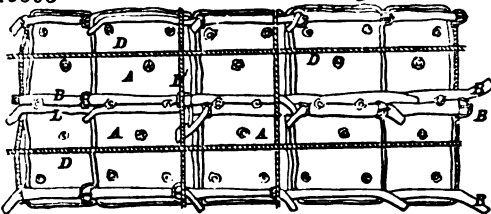
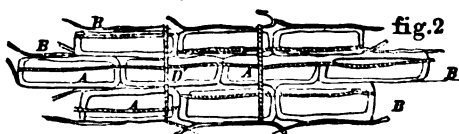


fig. 2



19350

fig. 1

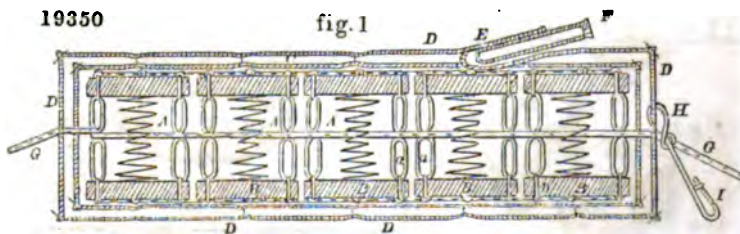
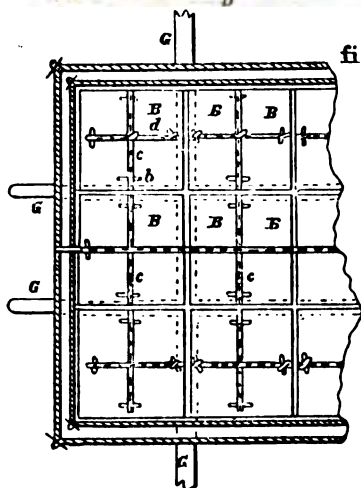


fig. 2



22467

fig. 1

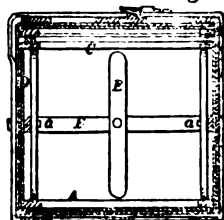
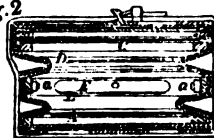
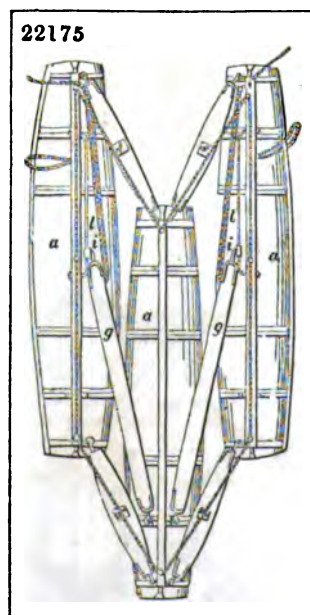
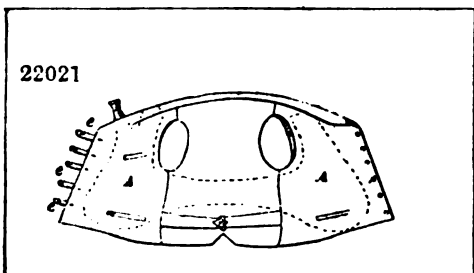
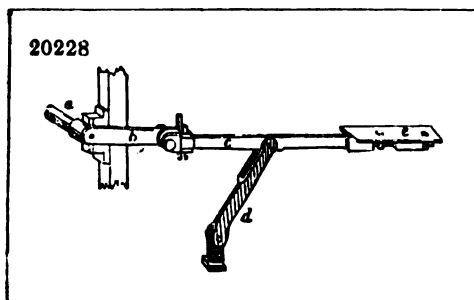
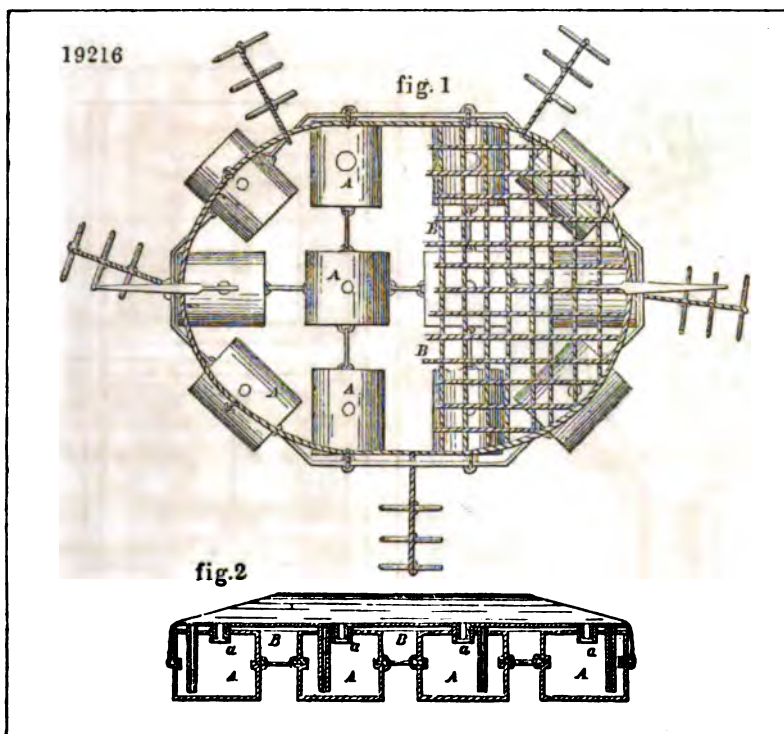
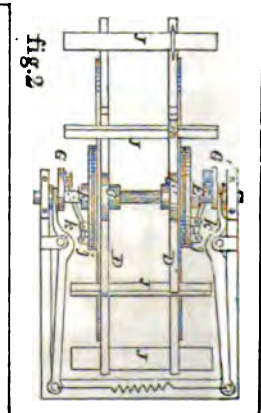
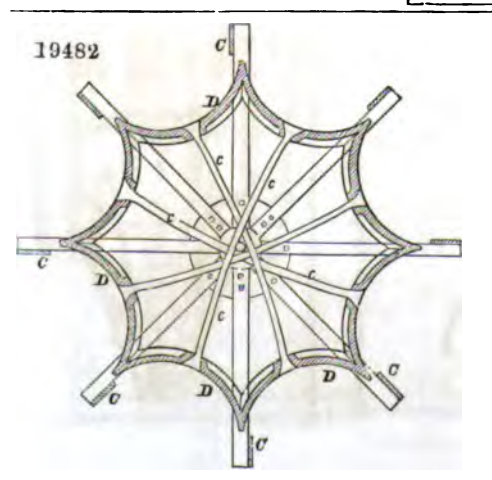
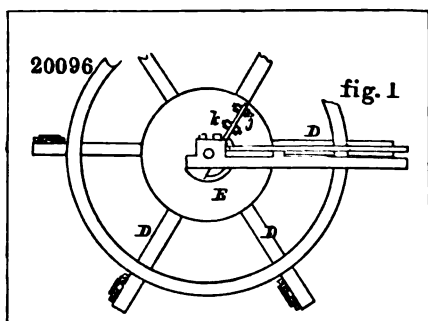
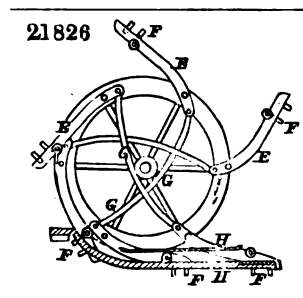
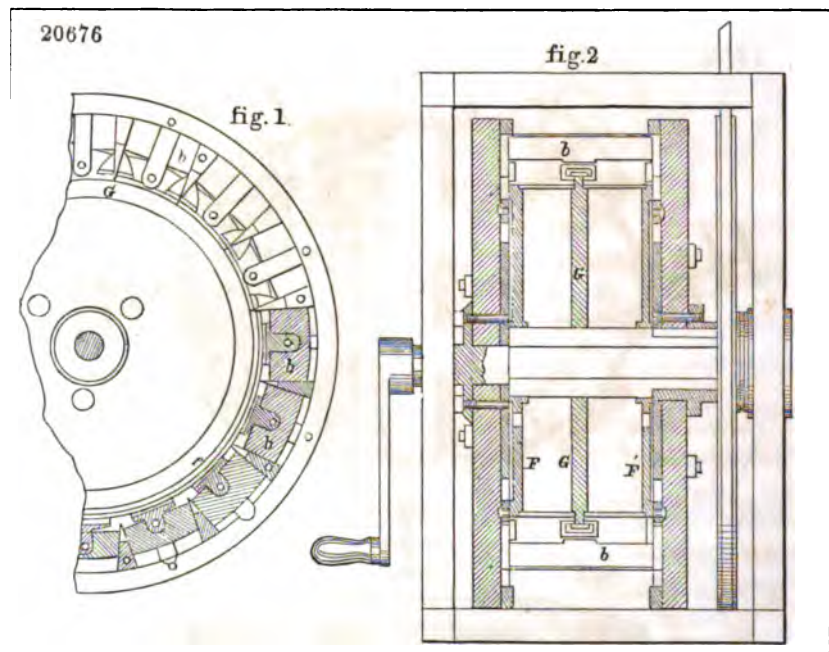


fig. 2

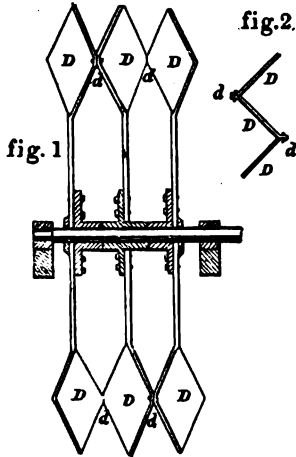




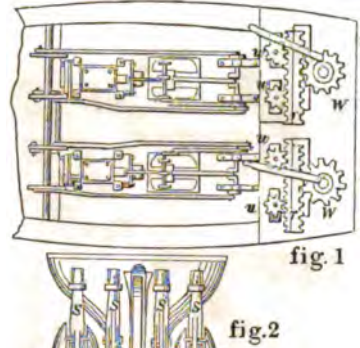




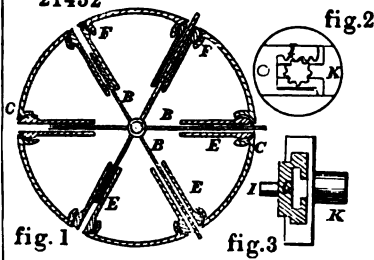
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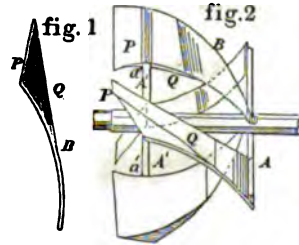
20806



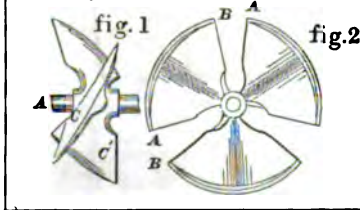
21432



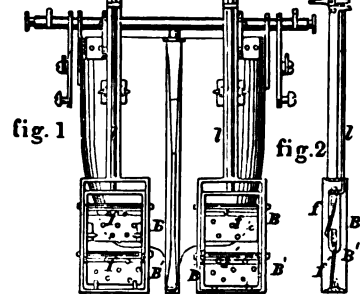
20744



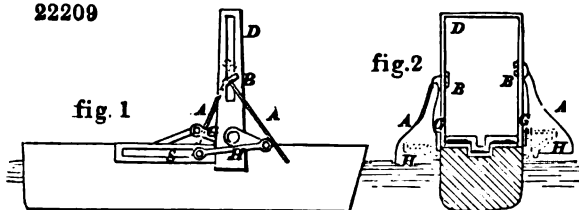
20953



22016



22209



22373

fig. 1

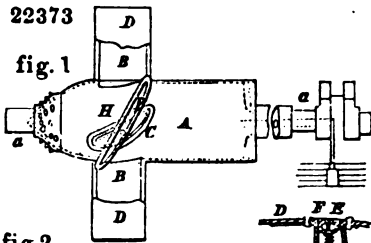


fig. 2

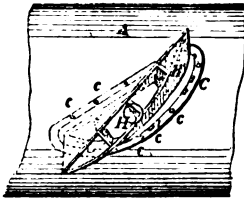
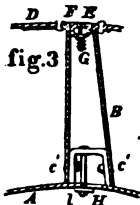
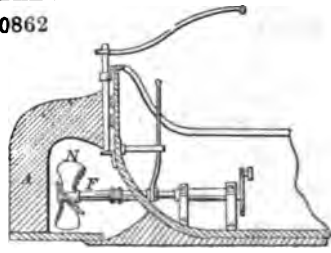


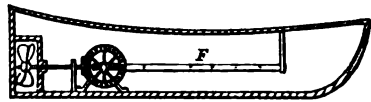
fig. 3



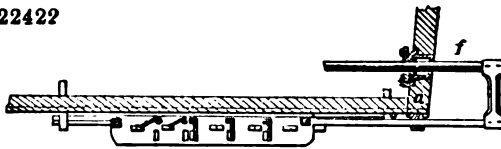
20862



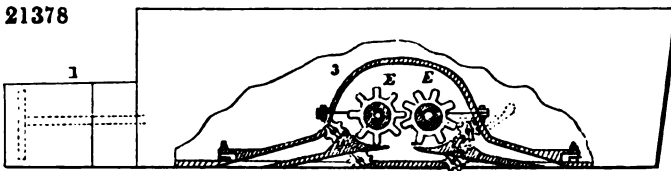
22346



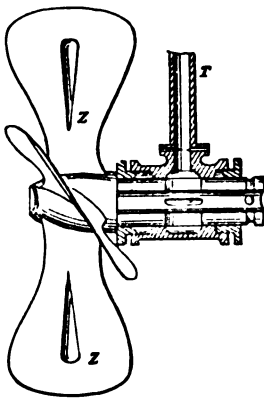
22422



21378



21650



20889

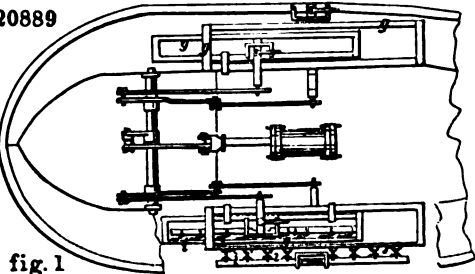
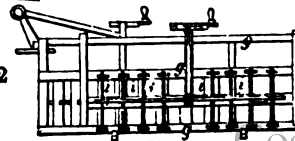
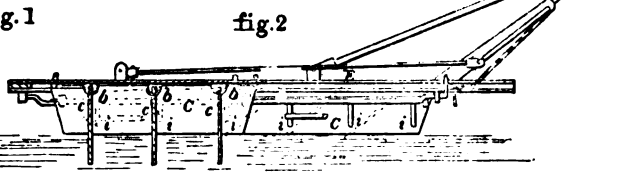
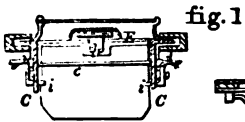


fig. 1

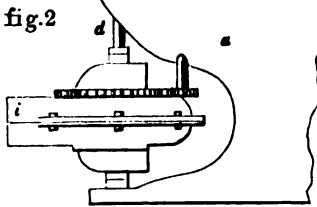
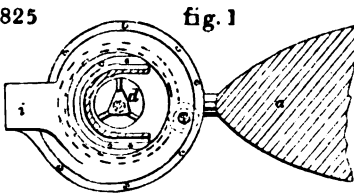
fig. 2



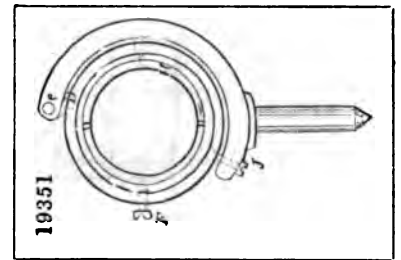
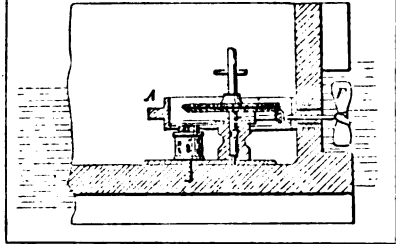
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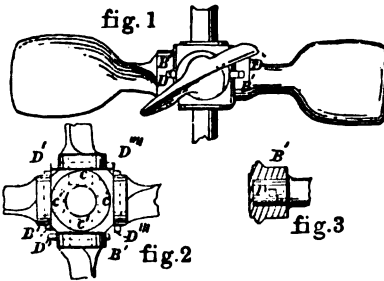
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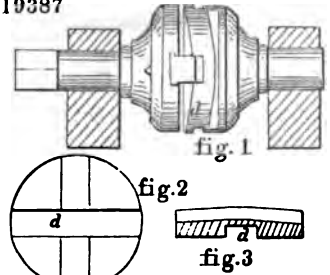
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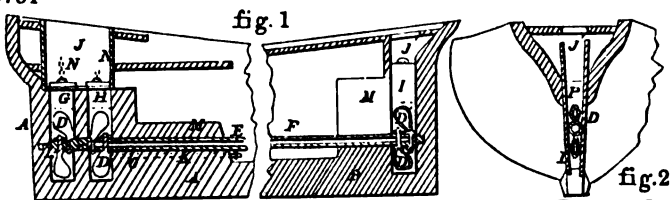
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19387

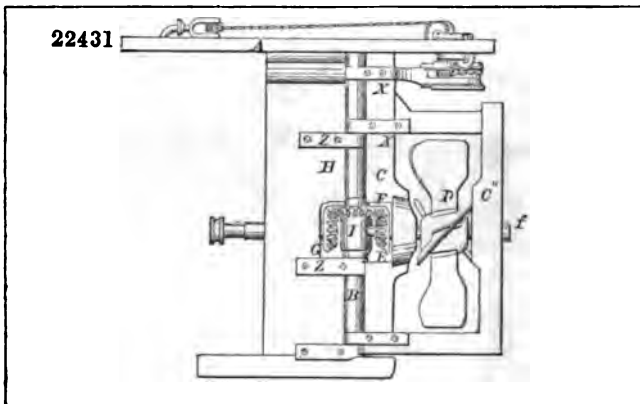


20751

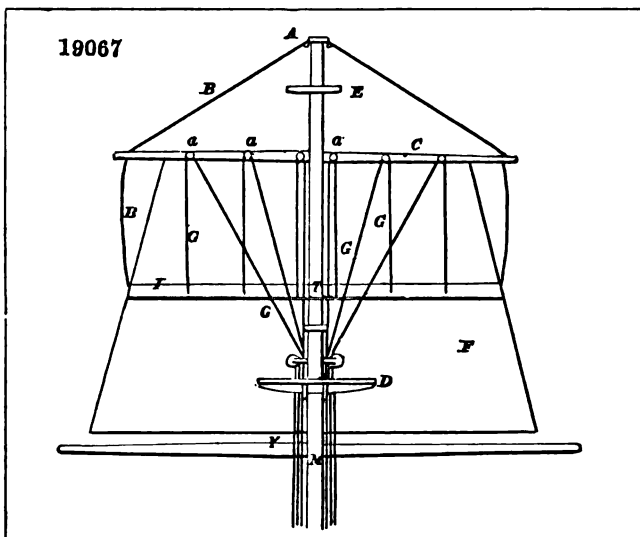




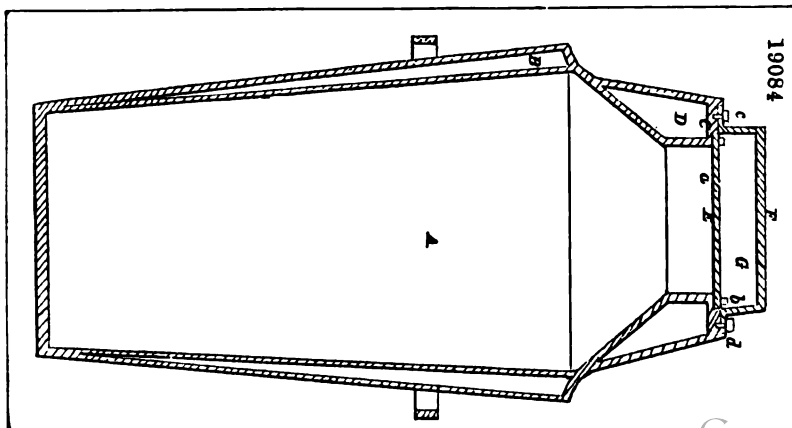
22431



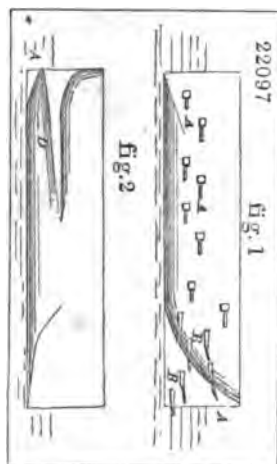
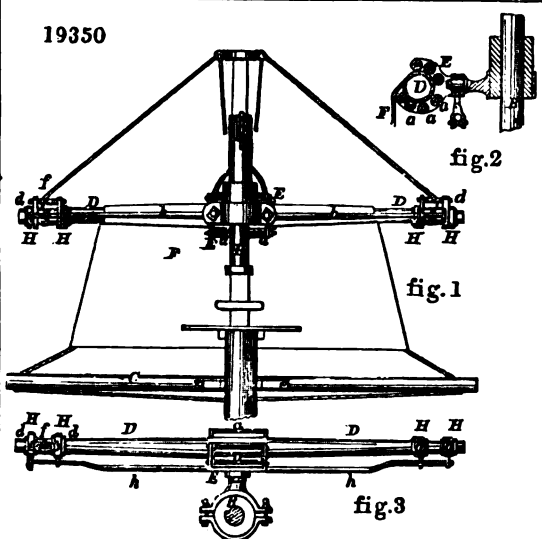
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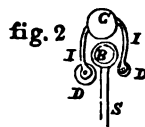
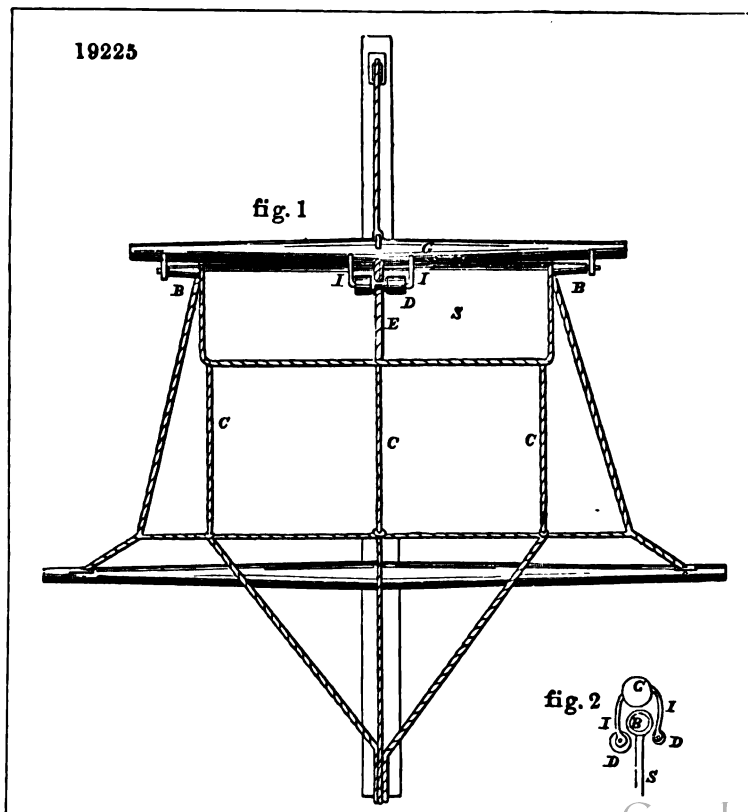
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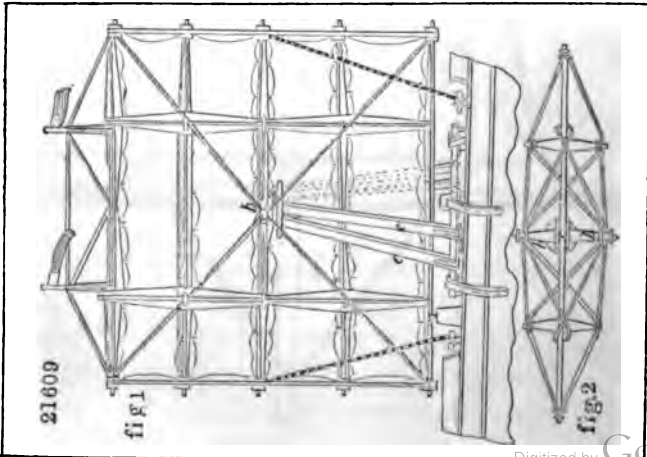
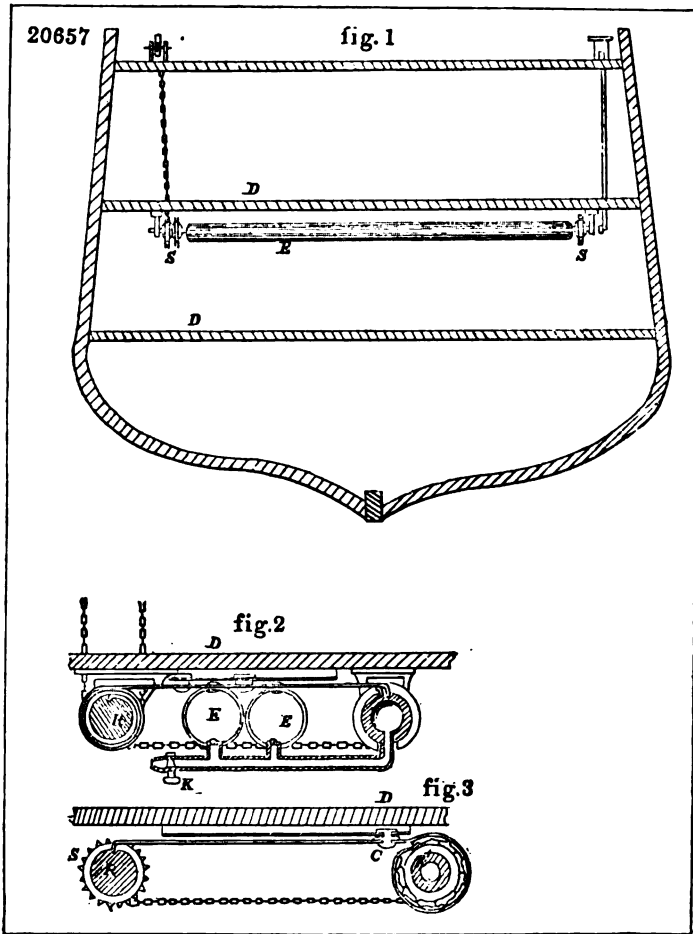


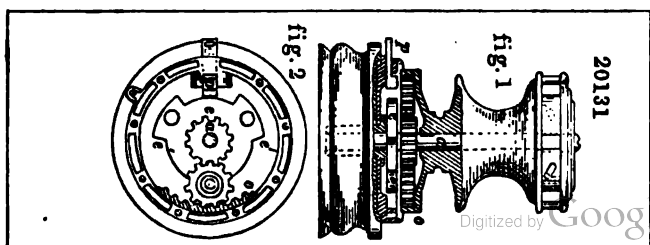
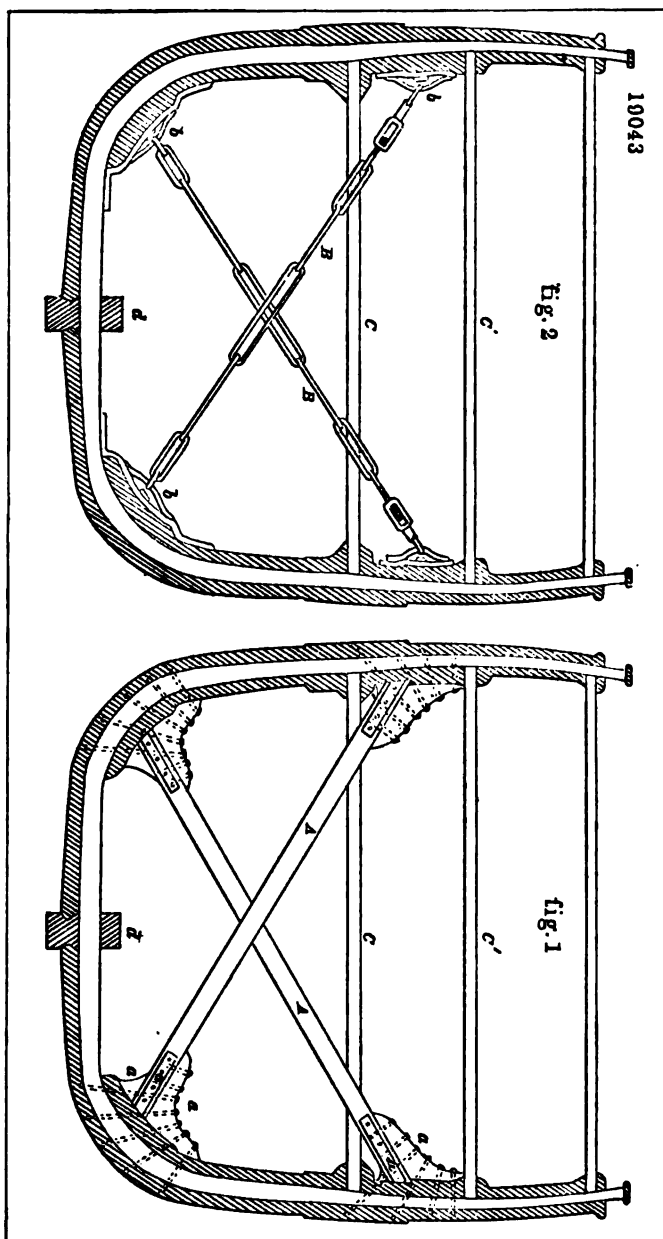
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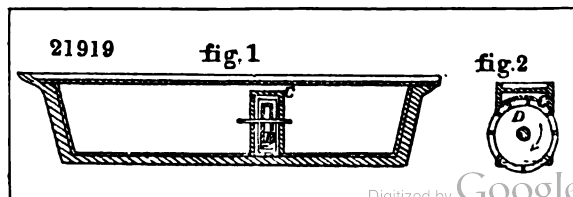
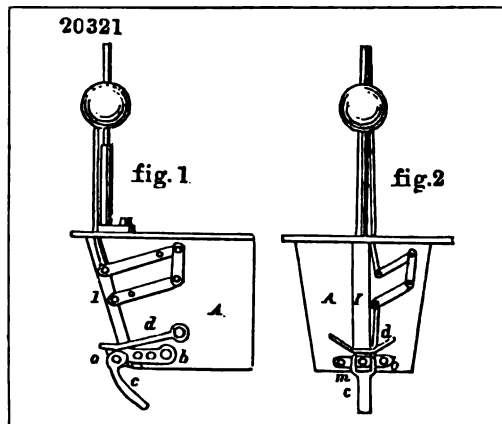
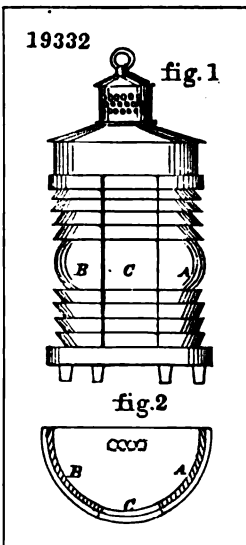
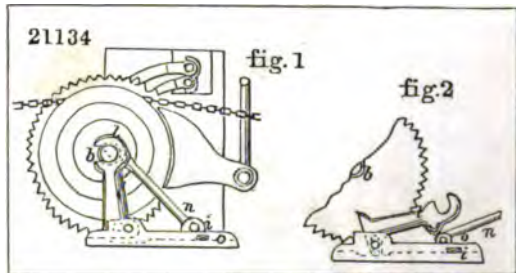
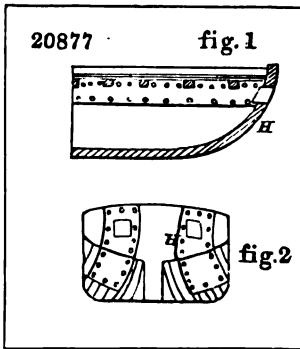
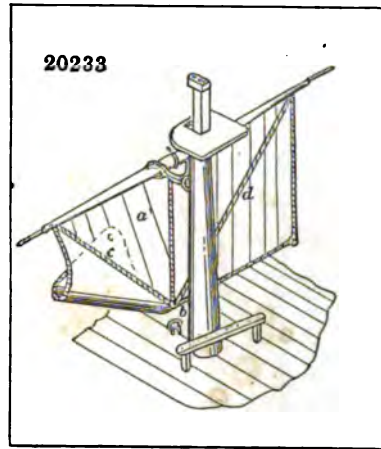
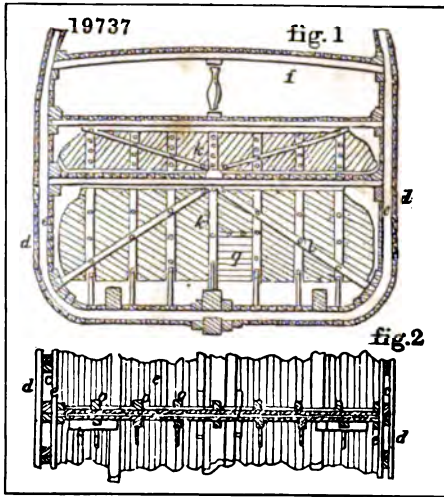


19225









19139

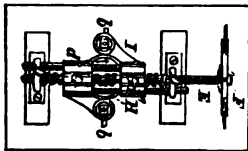
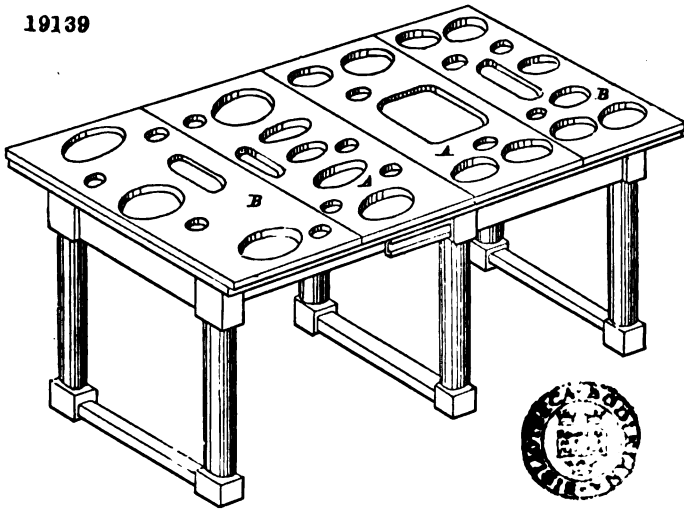


fig. 2

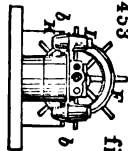
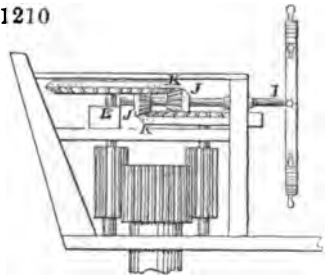


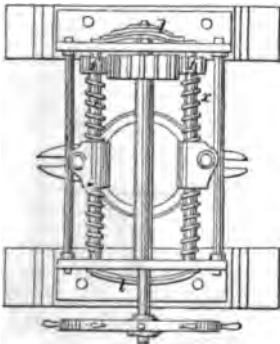
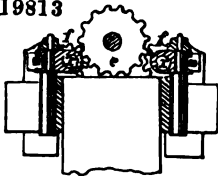
fig. 1

22453

21210



19813



20239

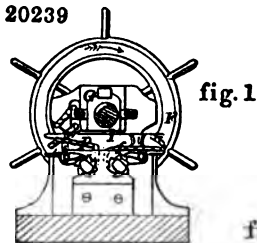


fig. 1

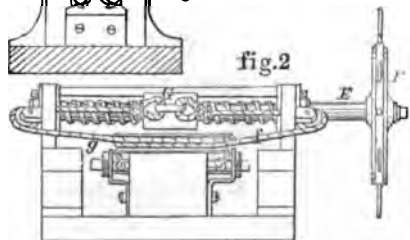
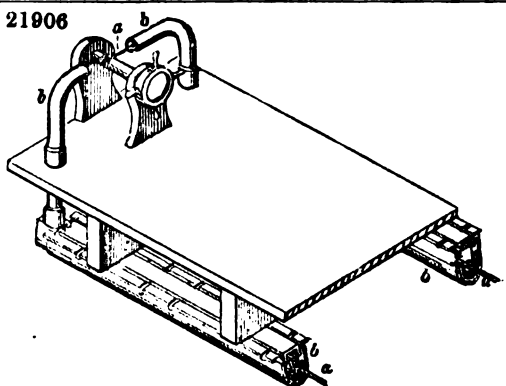
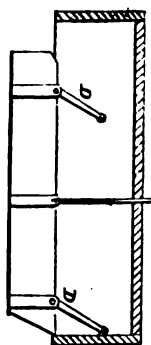


fig. 2

21906



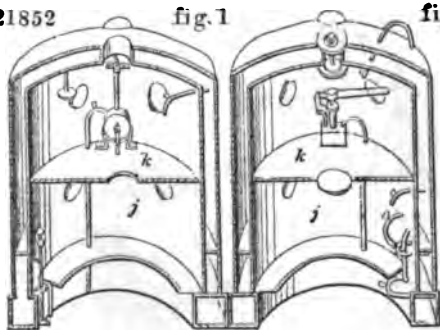
22068



21852

fig. 1

fig. 2

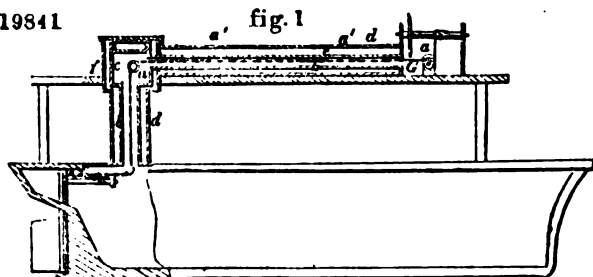


21917

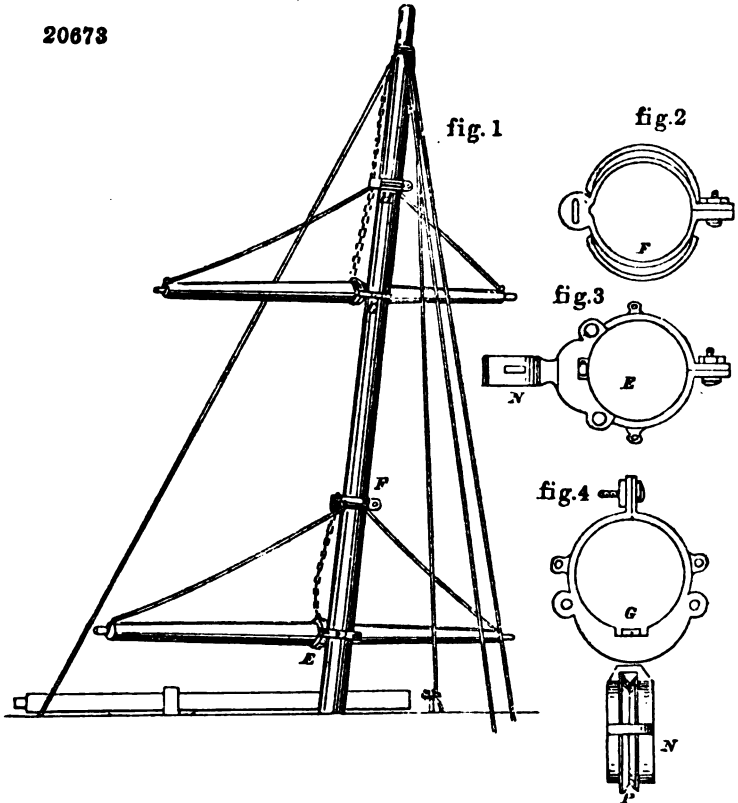


19841

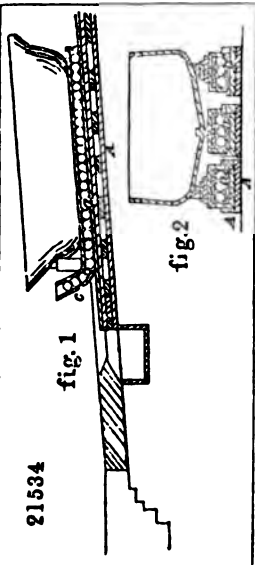
fig. 1



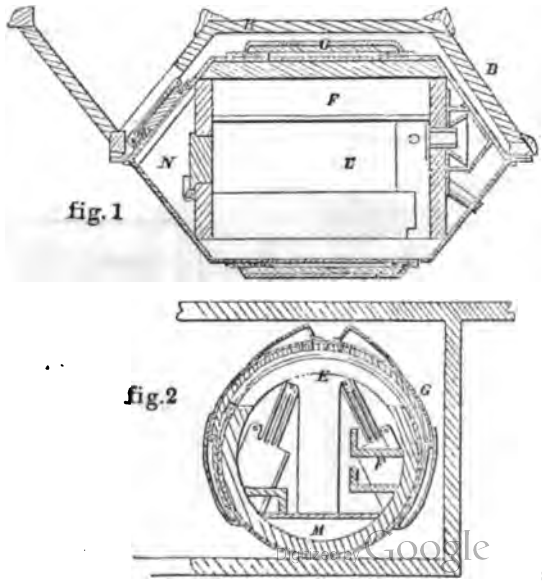
20673



21534

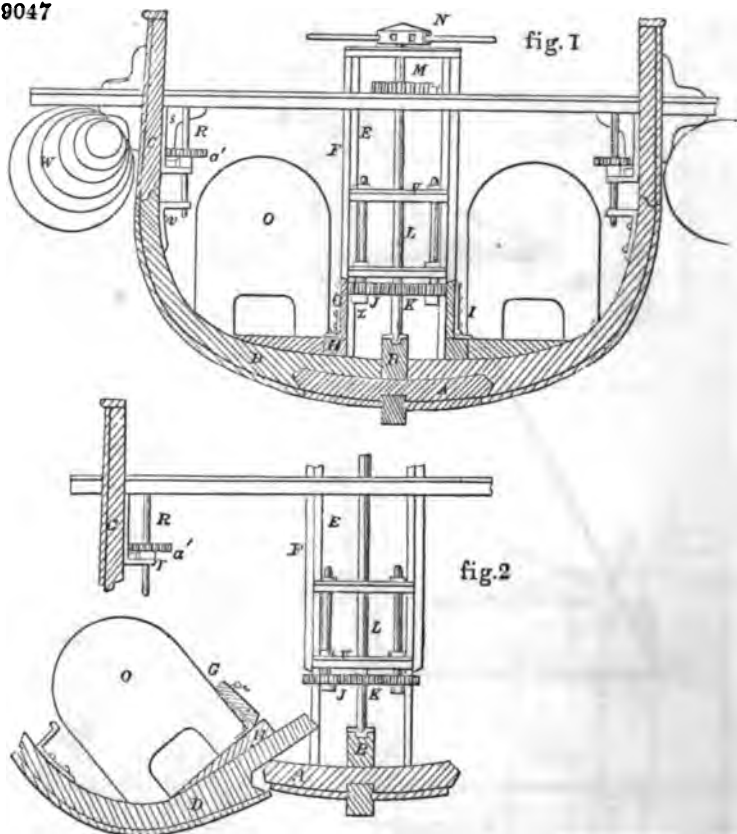


20426

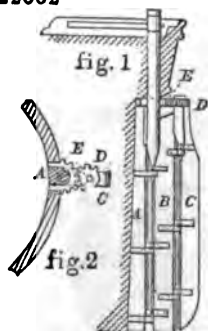




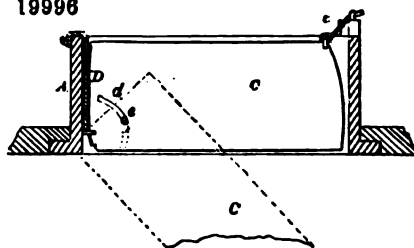
19047

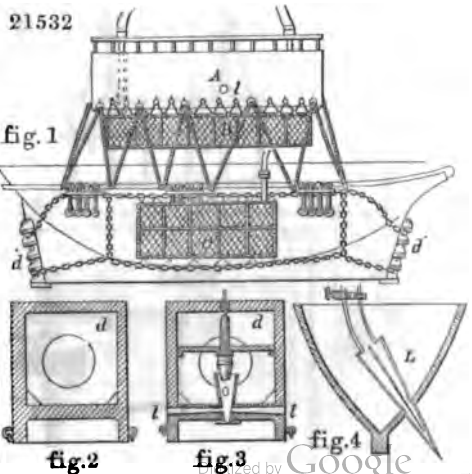
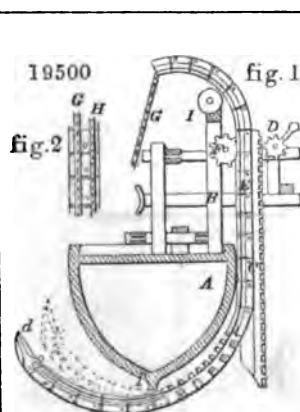
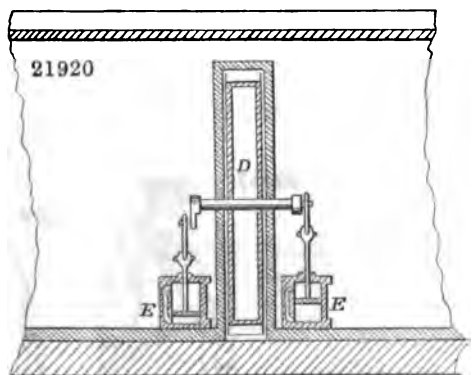
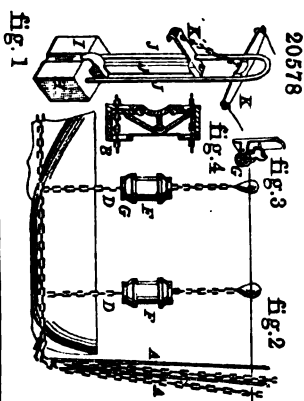
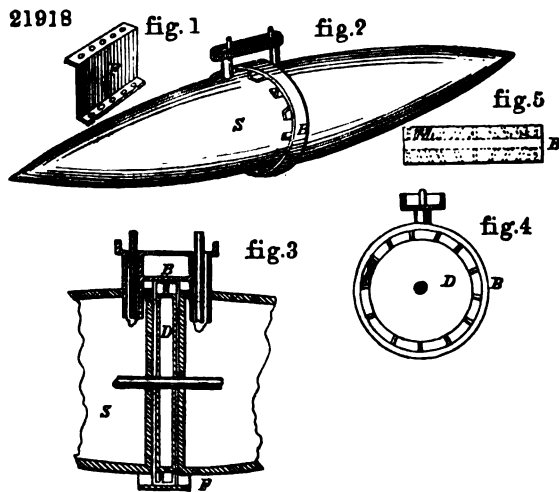


22002

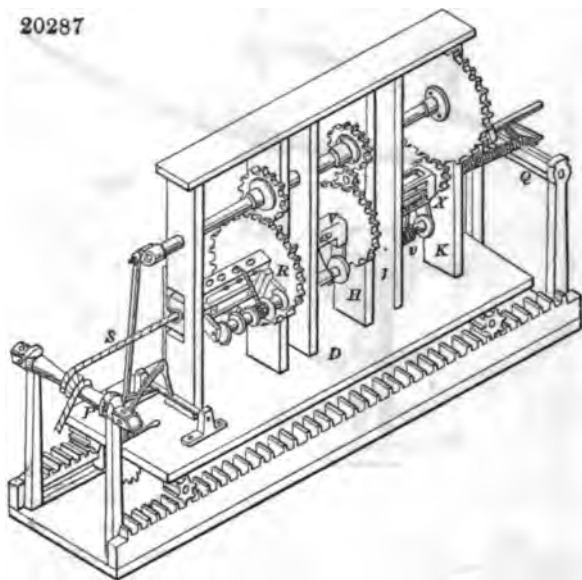


## 19996





20287

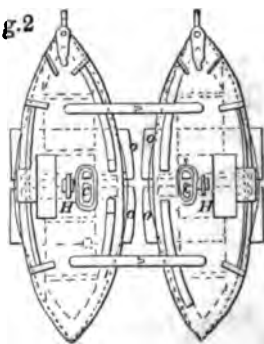


22457

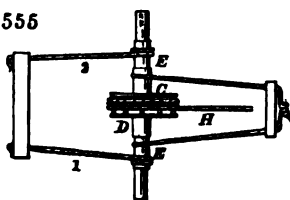
fig. 1

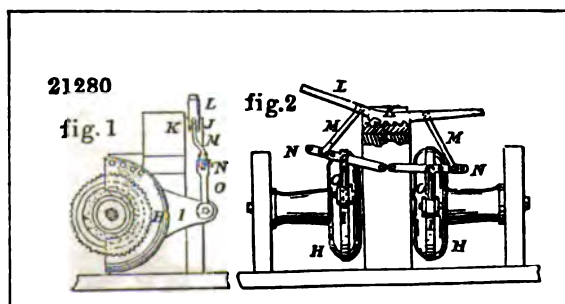
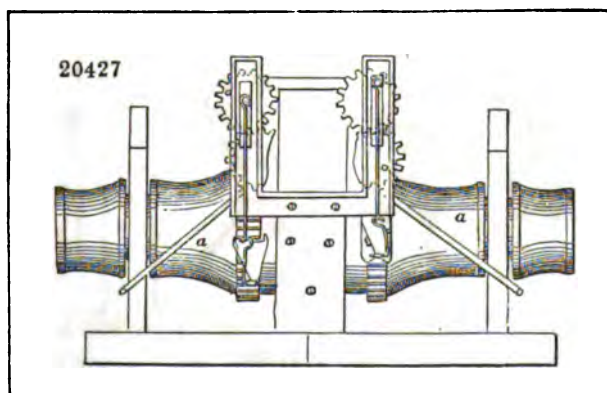
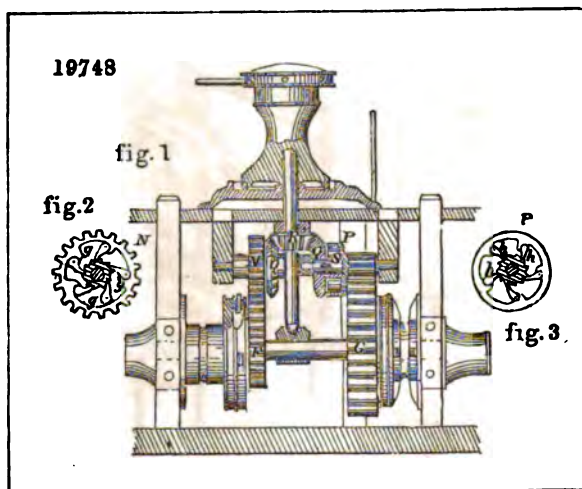


fig. 2

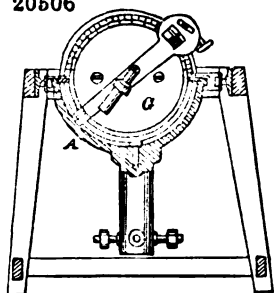


20556

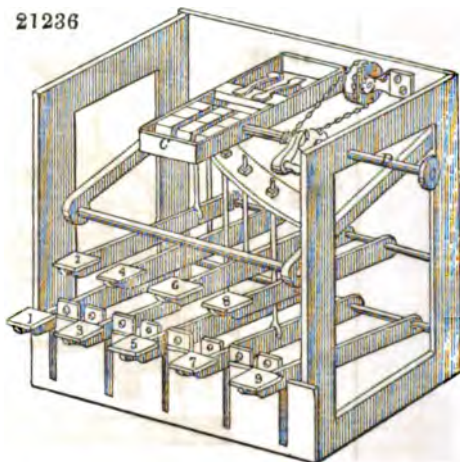




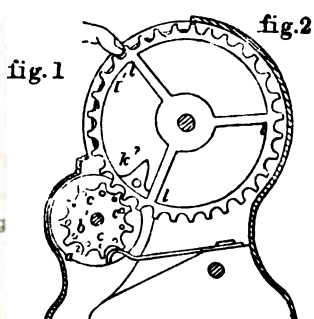
20506



21236



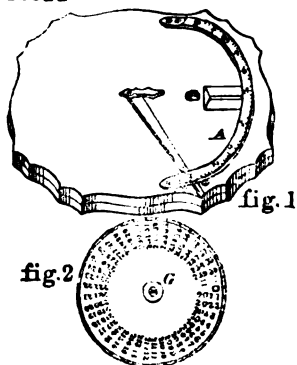
21243



21621

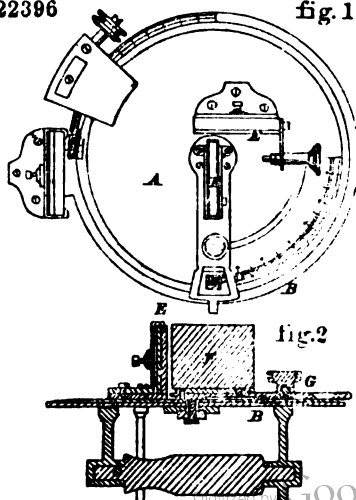


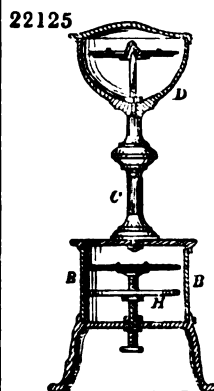
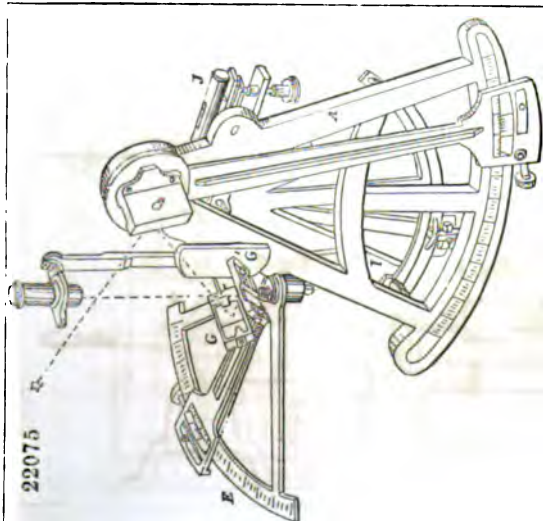
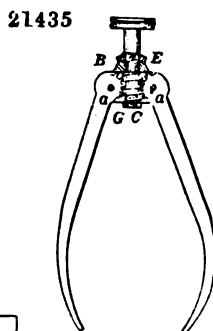
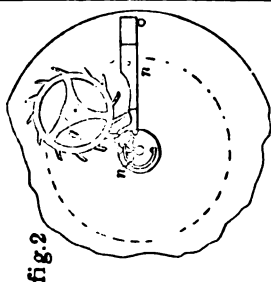
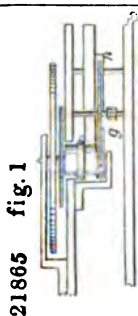
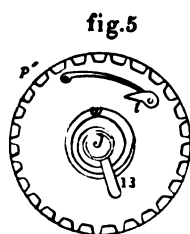
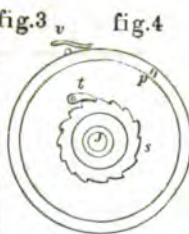
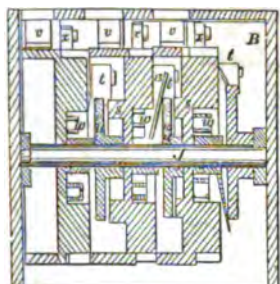
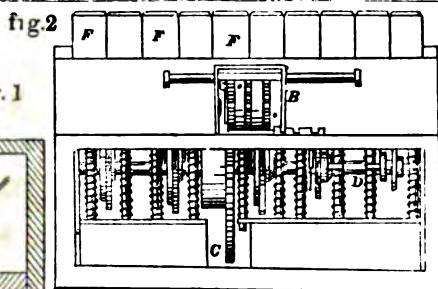
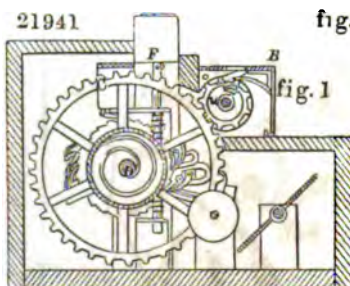
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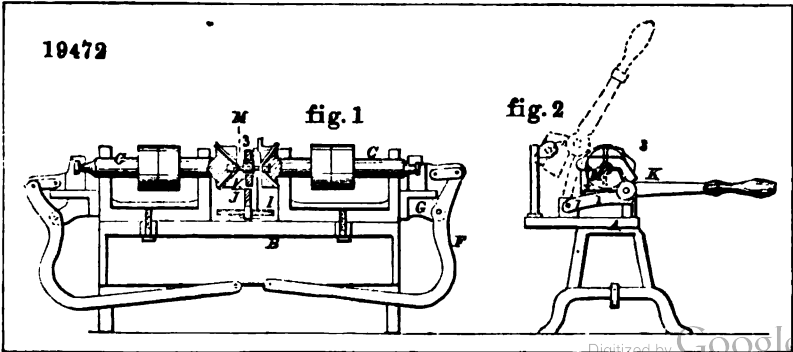
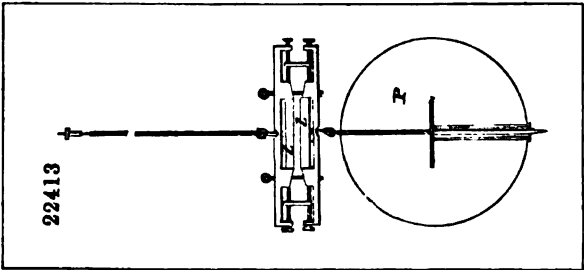
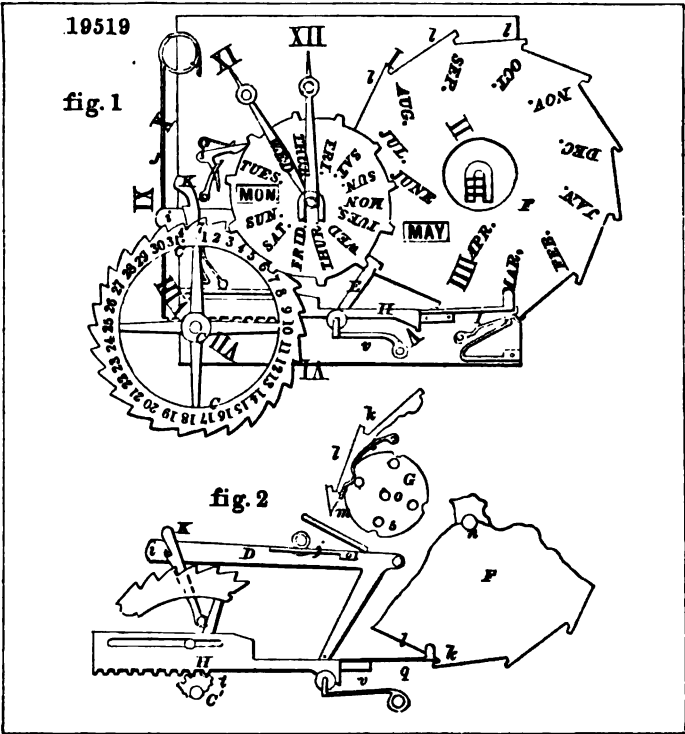


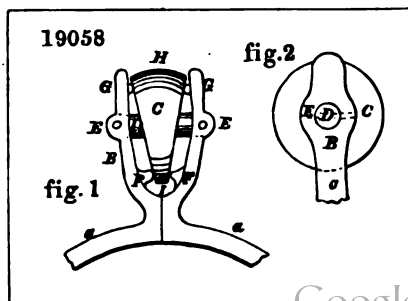
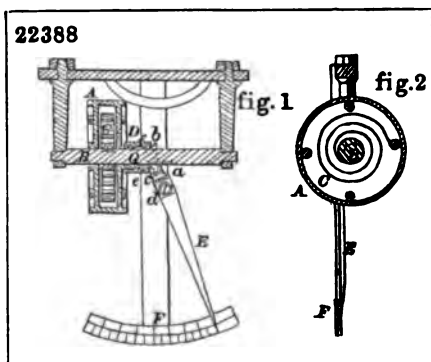
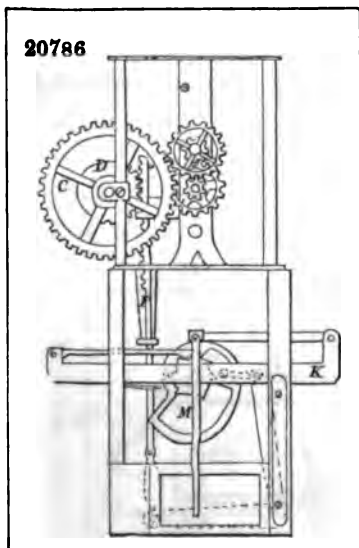
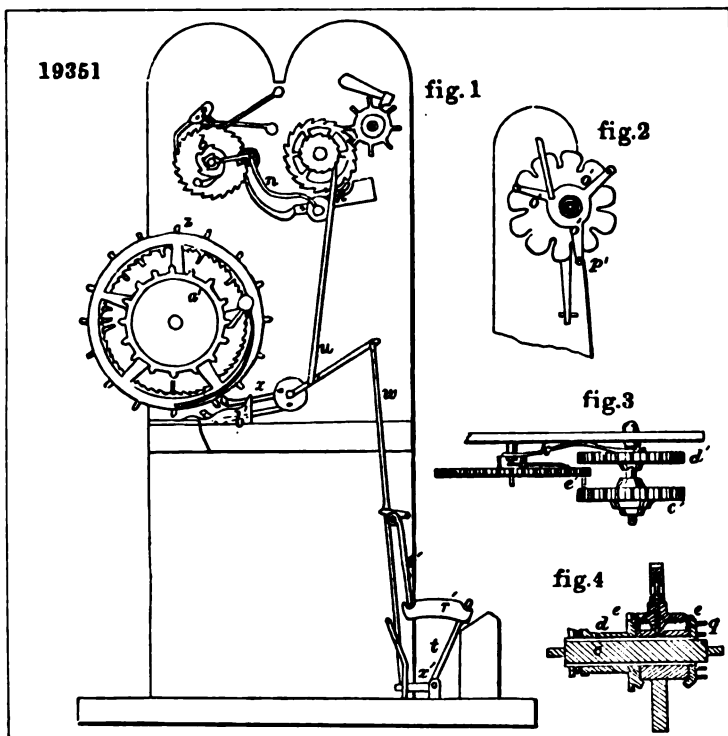
22396

fig. 1



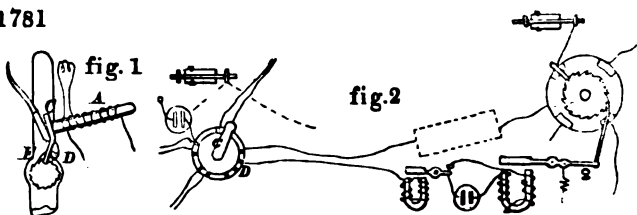




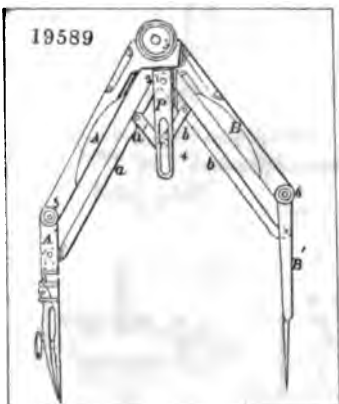




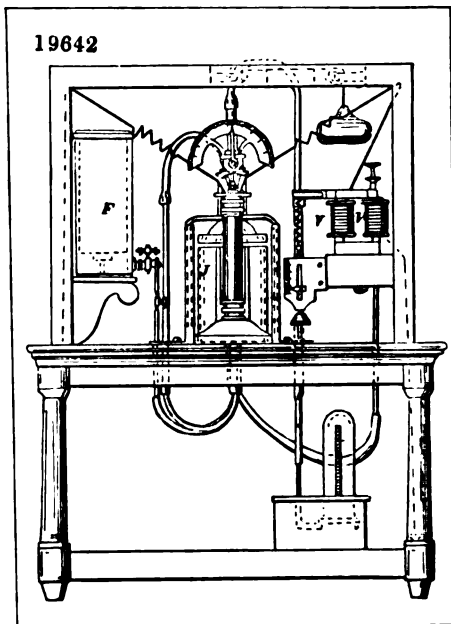
21781



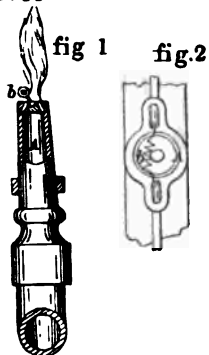
19589



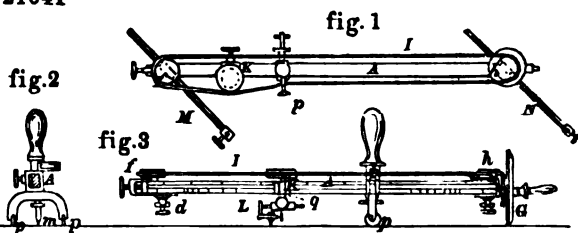
19642

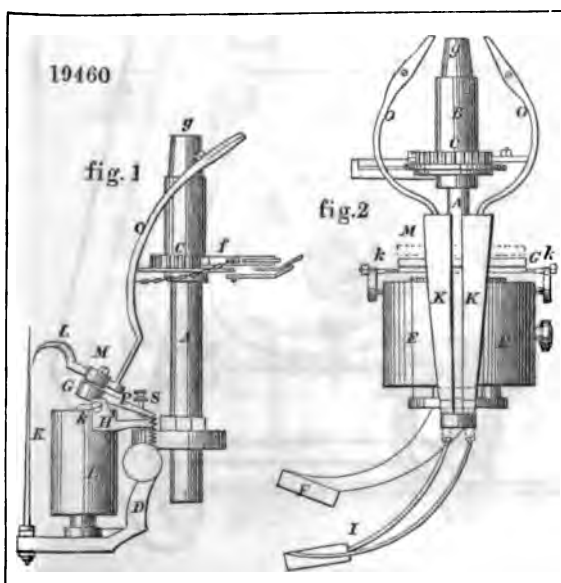
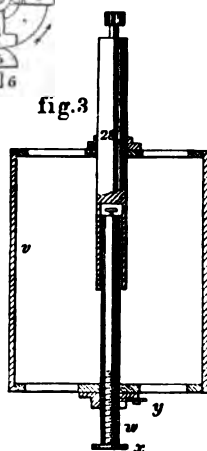
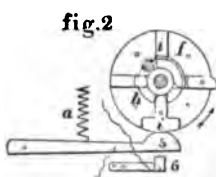
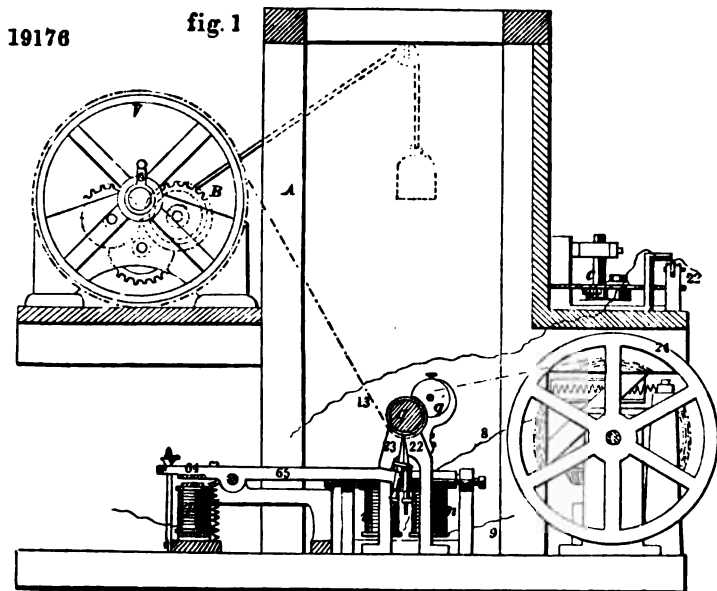


19766



21041





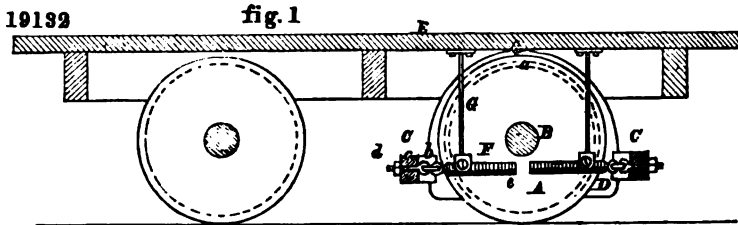
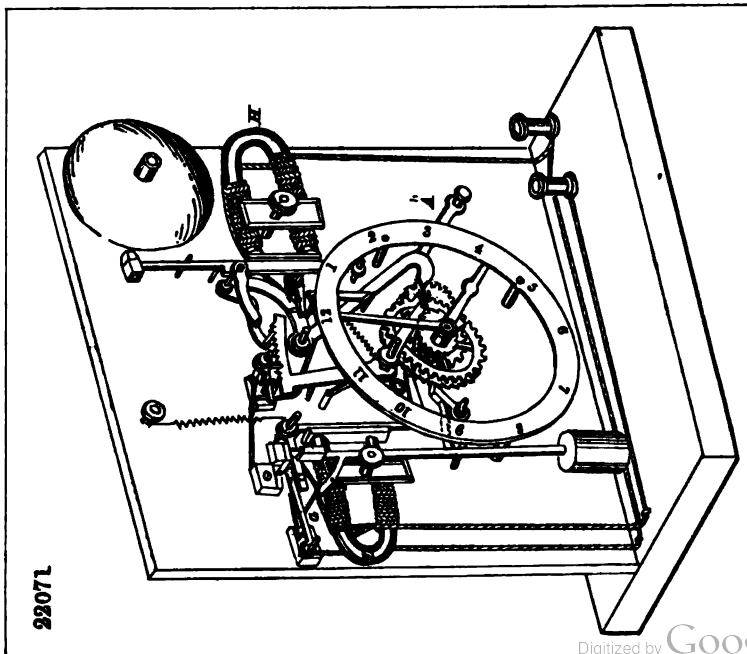
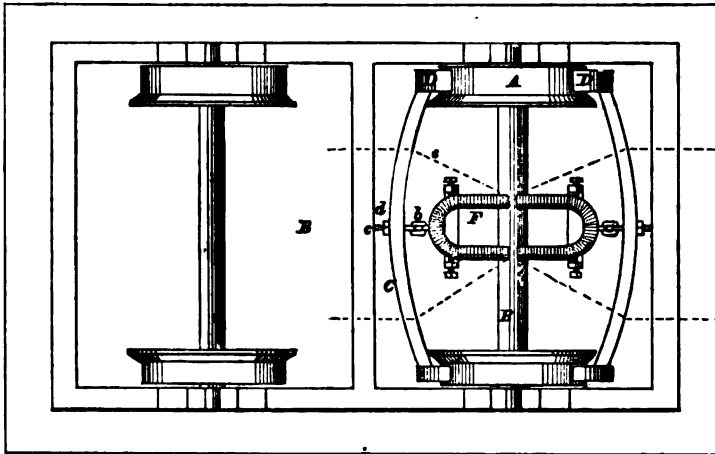
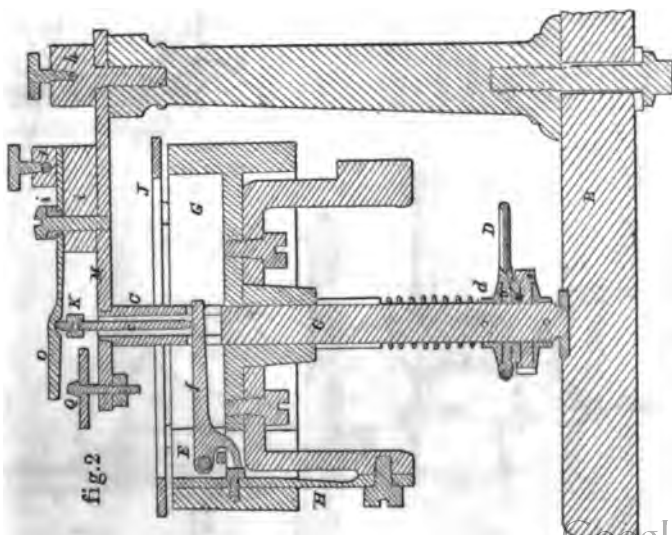
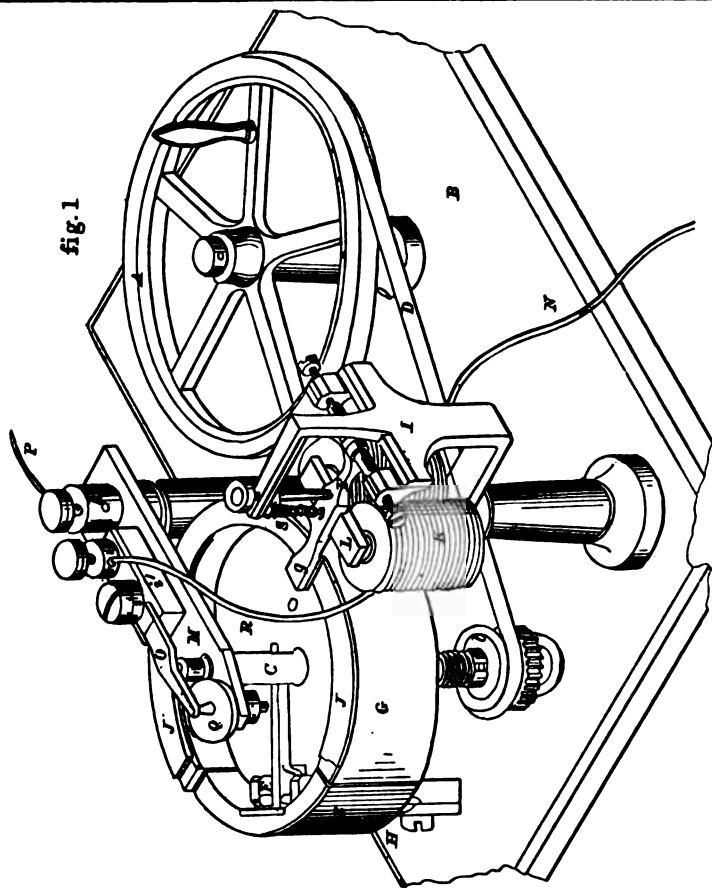
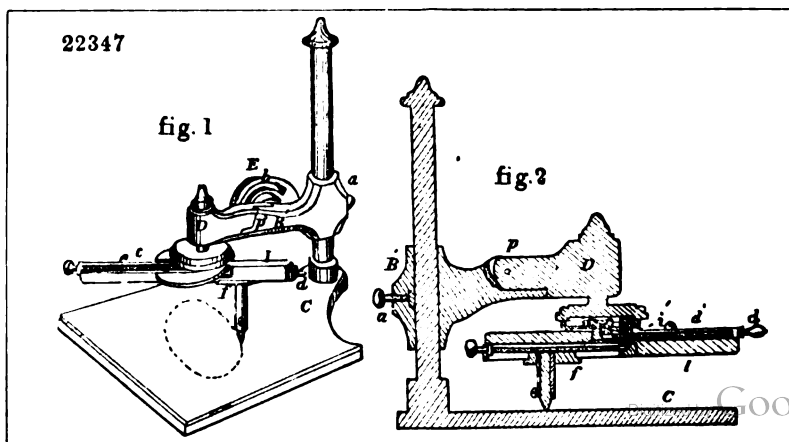
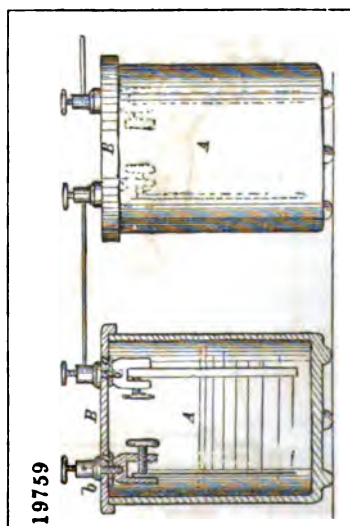
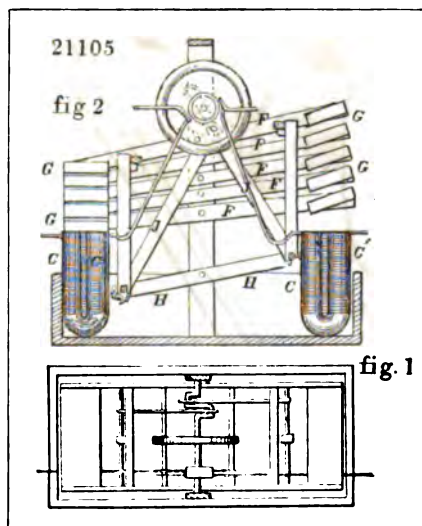
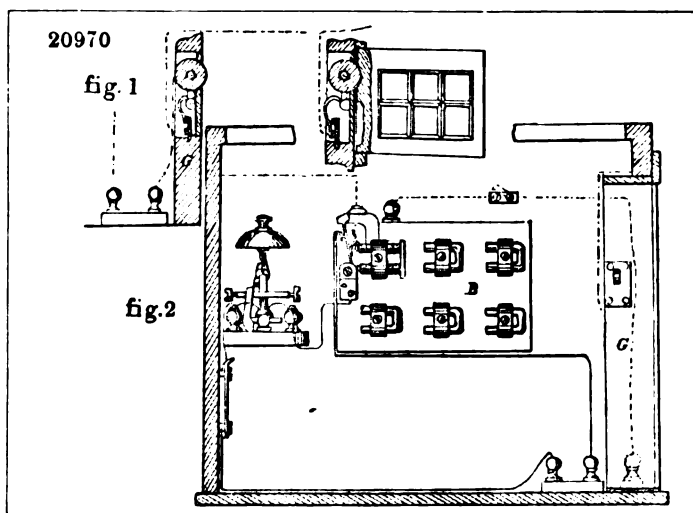


fig. 2





19042

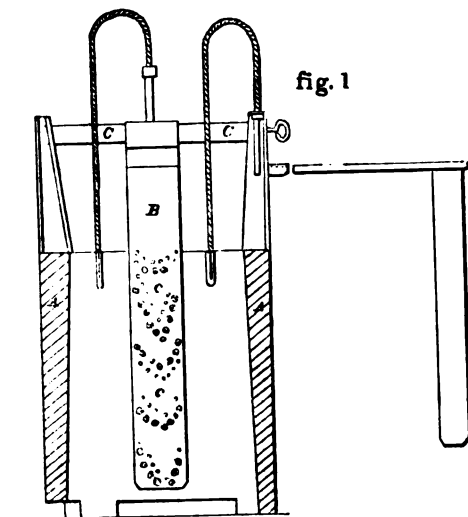


19245

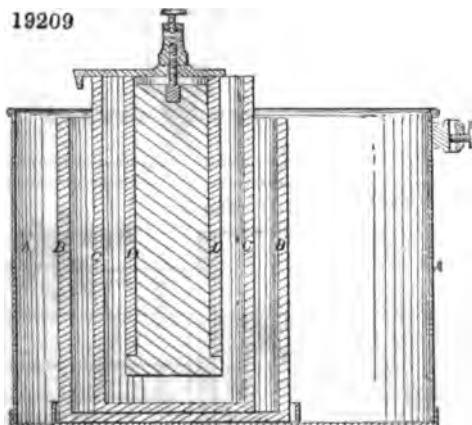
fig.2



fig.1



19209



20326

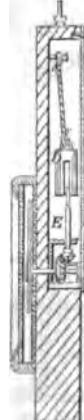


fig.1

22029

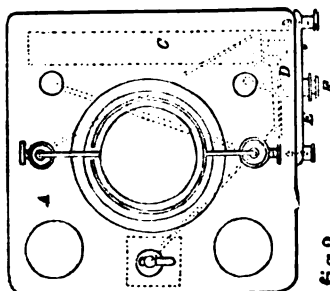
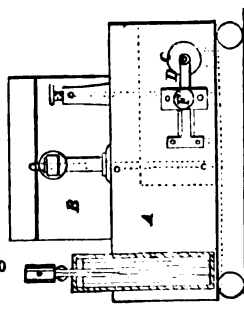
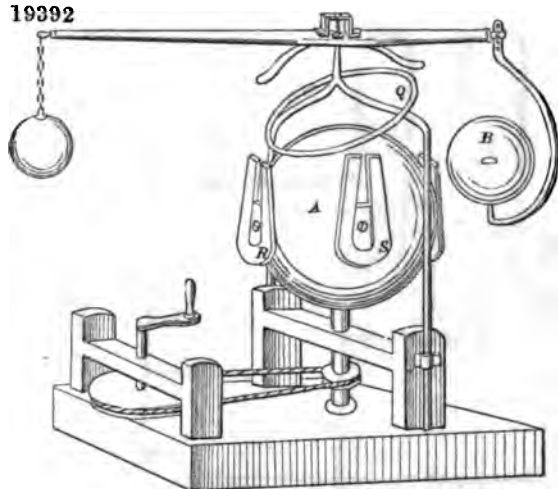


fig.2



19392



22378

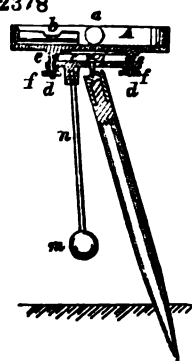
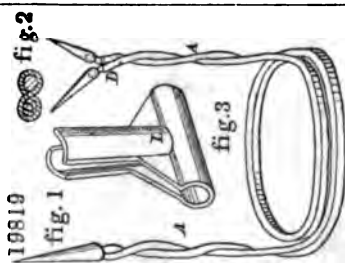
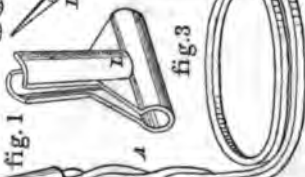


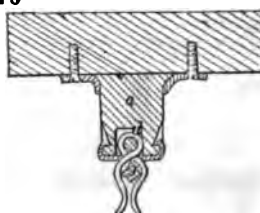
fig. 2



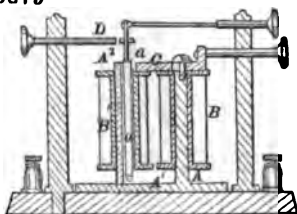
19819



20918



19379



22411

fig. 1

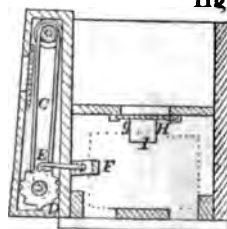
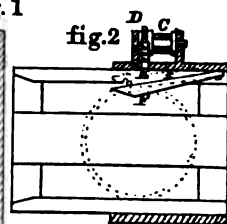


fig. 2



22188

fig. 1

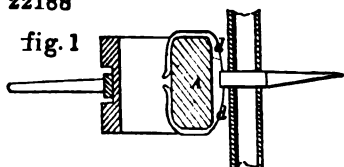
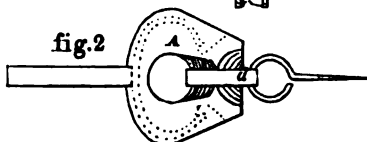
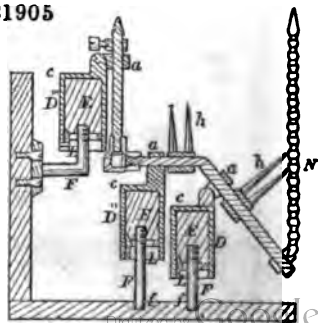
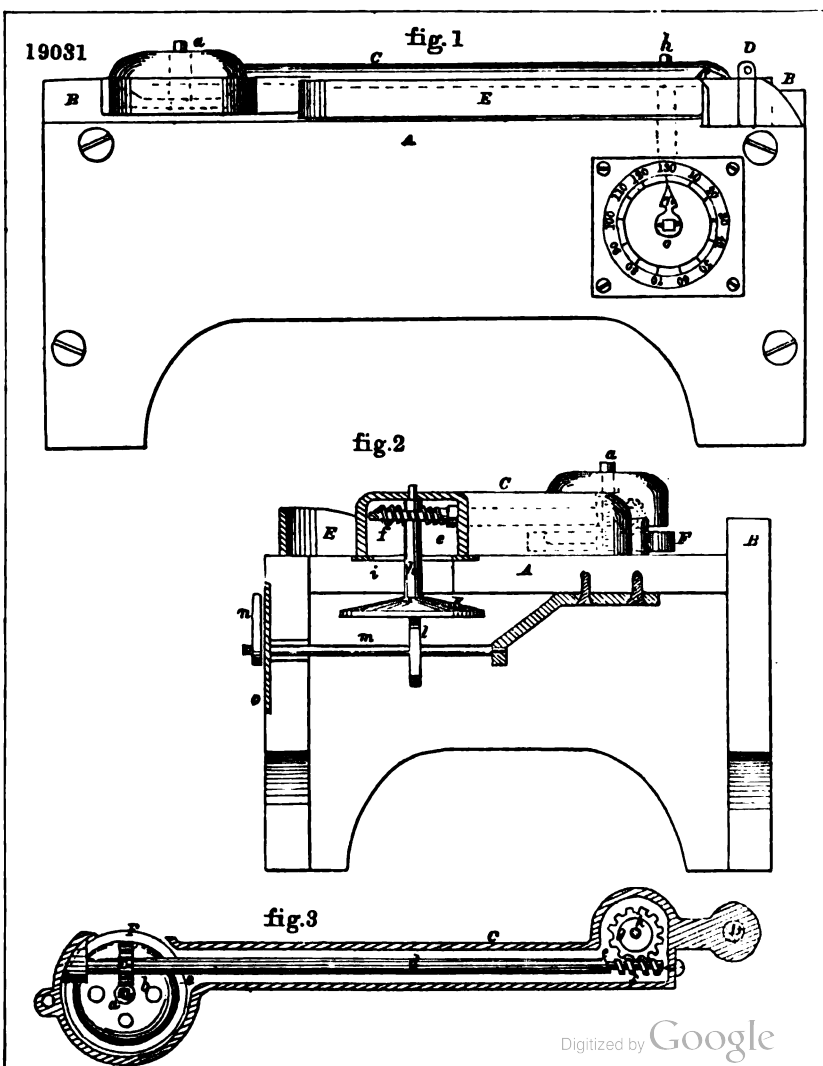
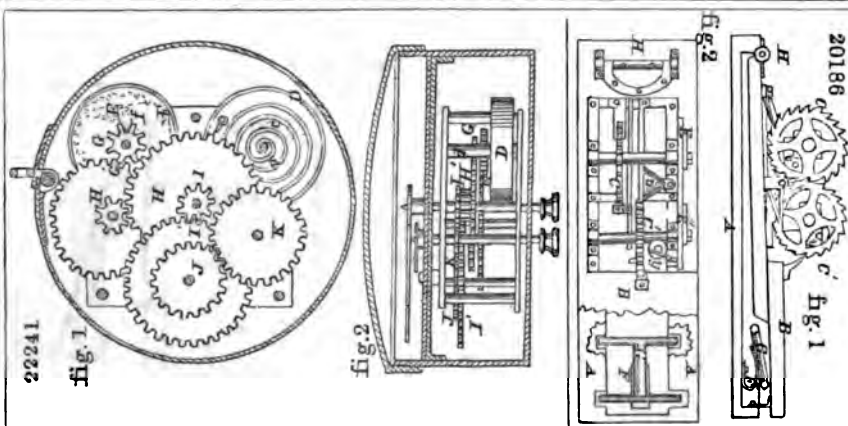


fig. 2

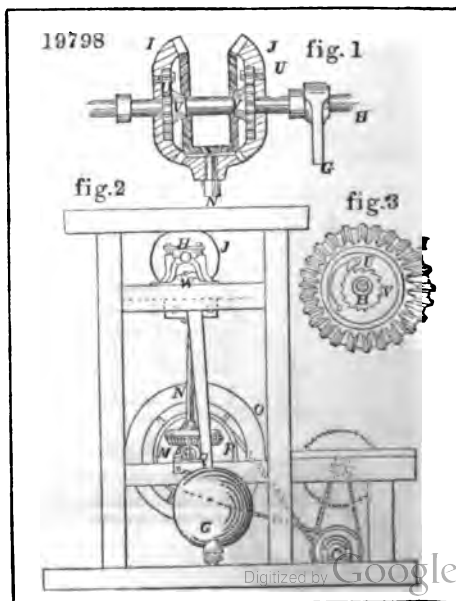
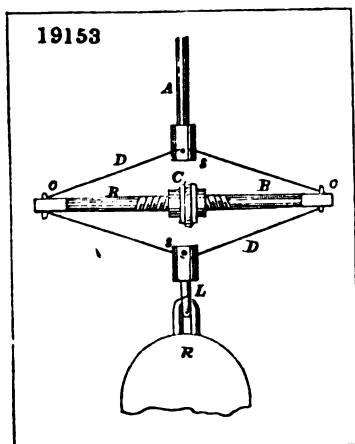
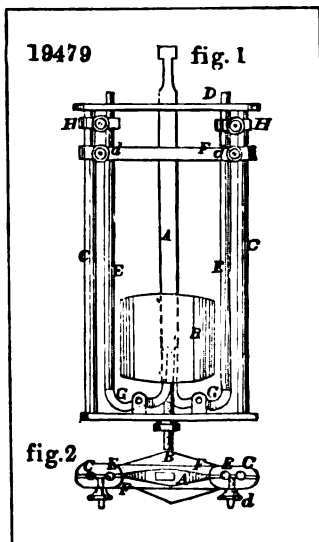
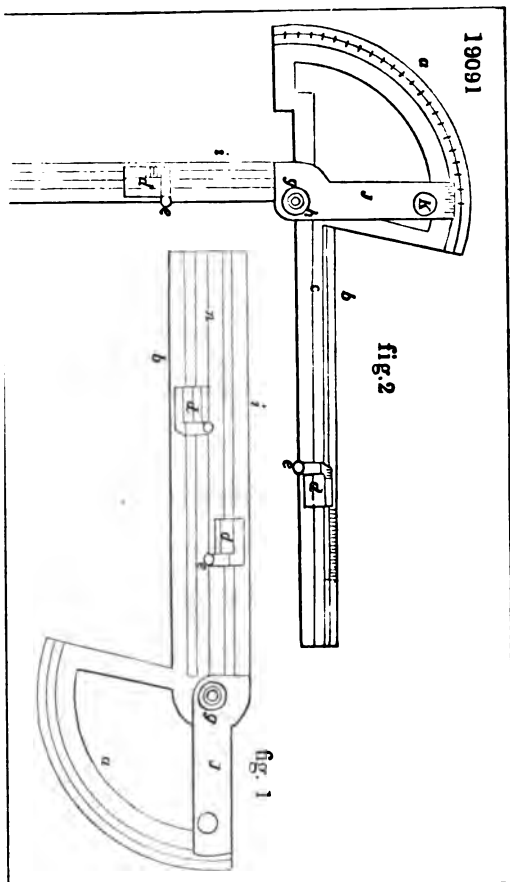


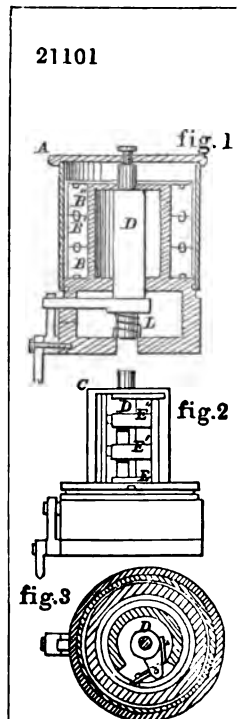
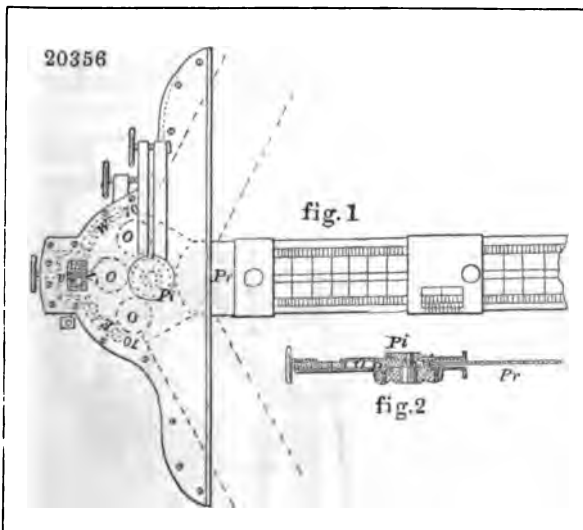
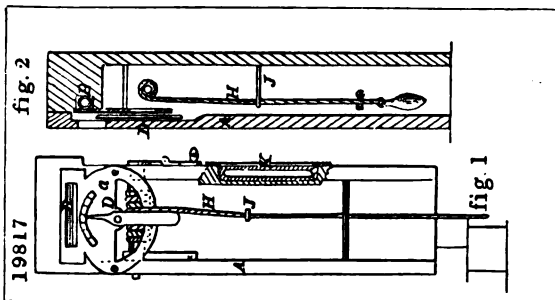
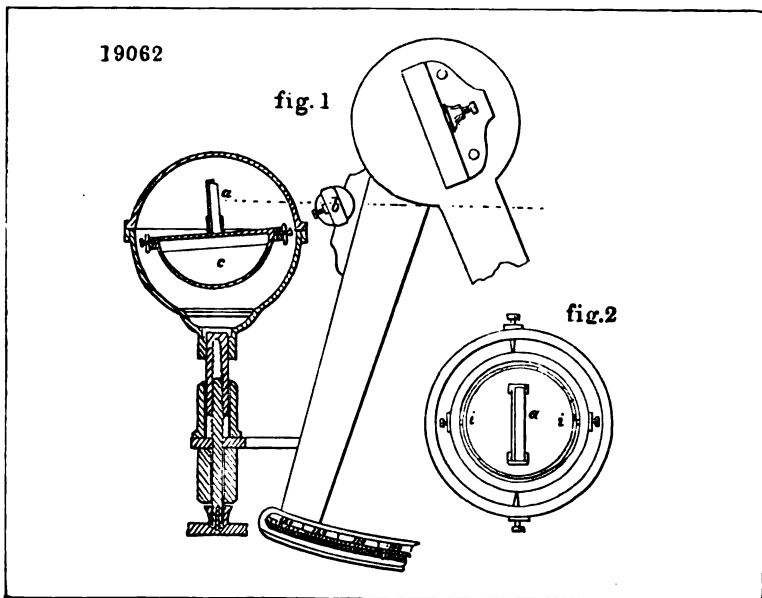
21905



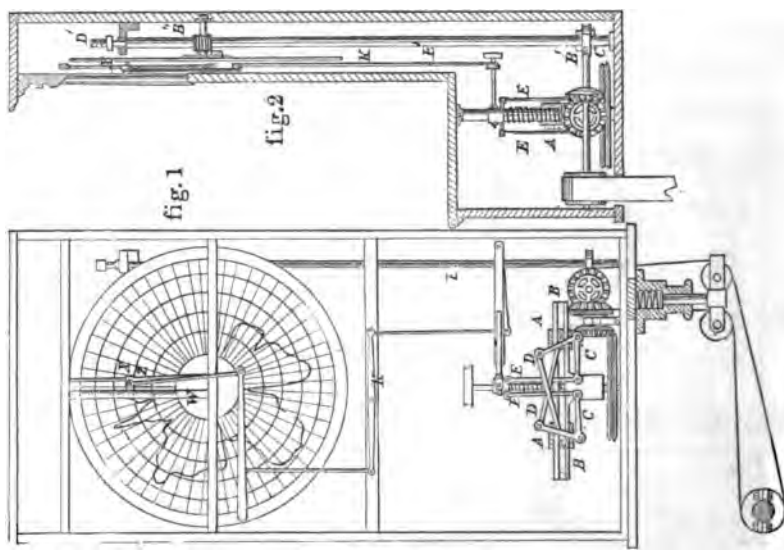








22081



19105

fig. 1

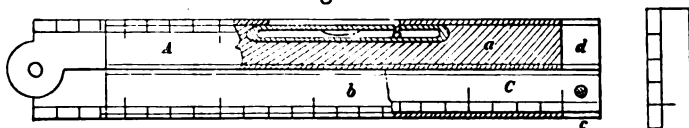
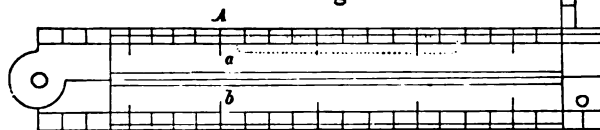
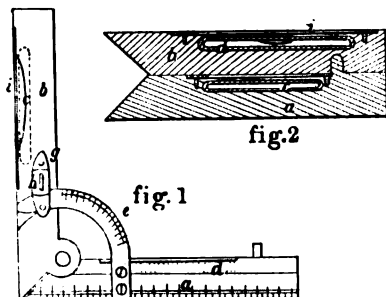


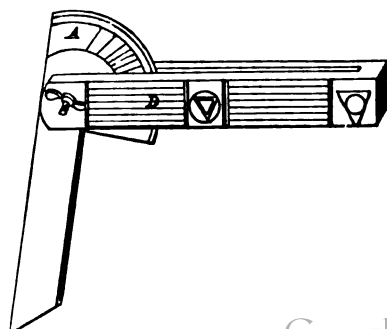
fig. 2



20943



21784



21688 fig.1

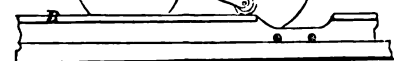
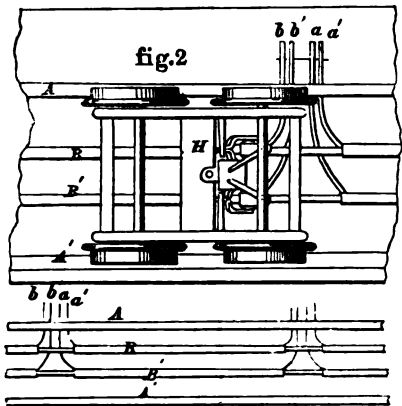
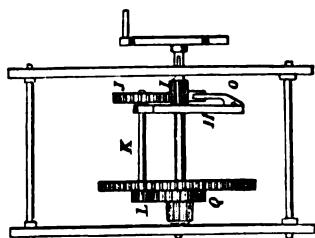


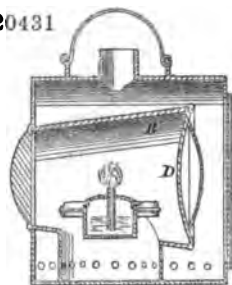
fig.2



21656



20431



21982

fig.1

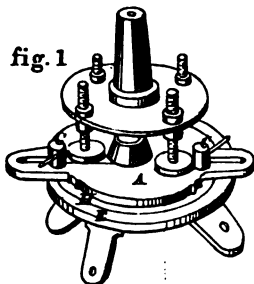
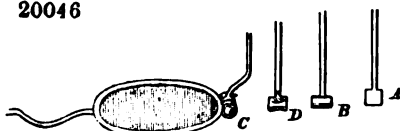


fig.2



20046



20706

fig.1

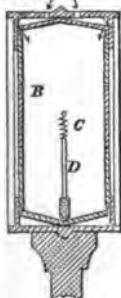
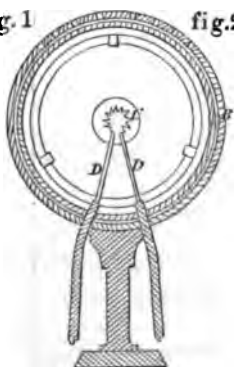
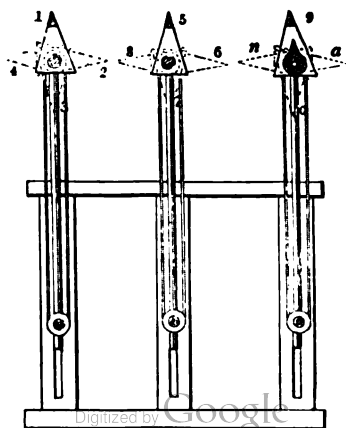


fig.2



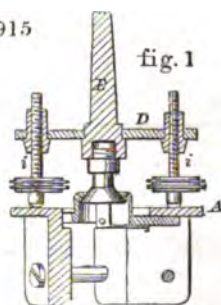
20402



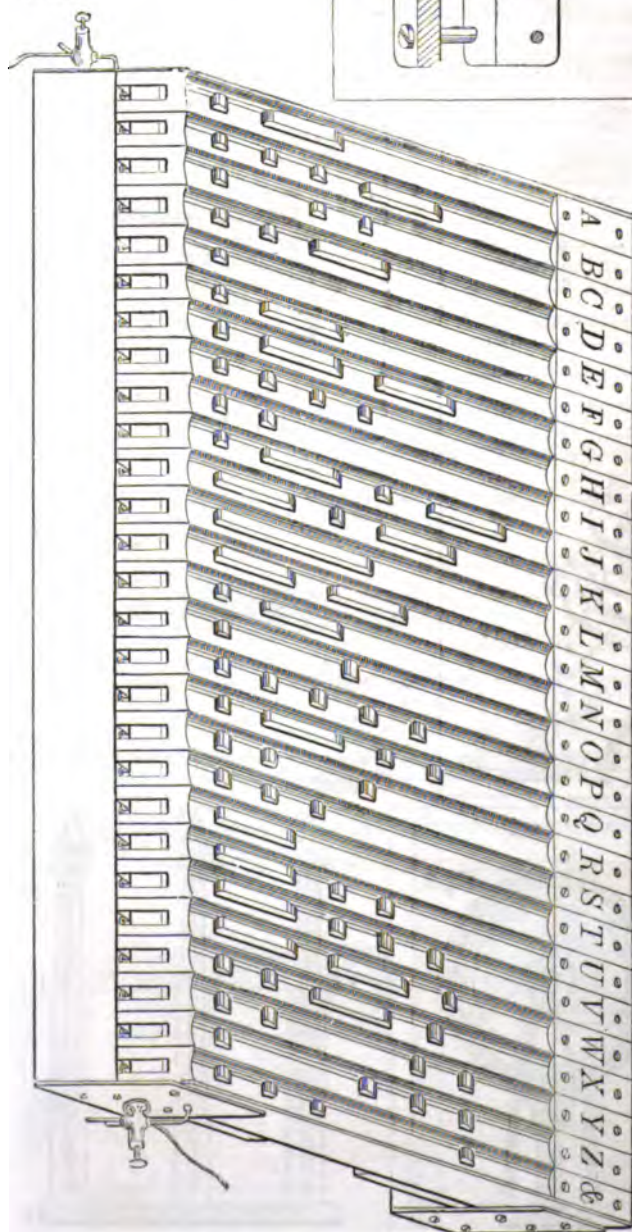
20915

fig. 1

fig. 2



19027



20908

fig. 1

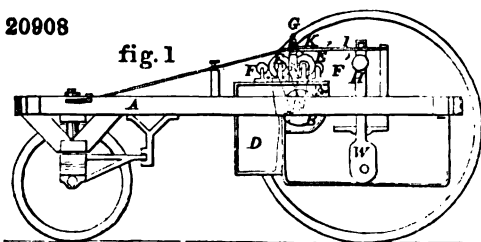
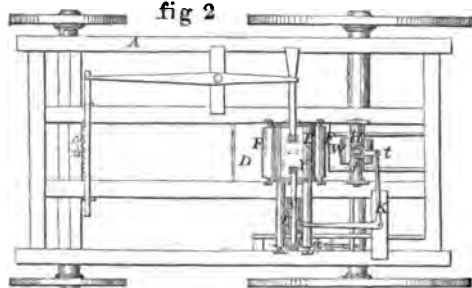
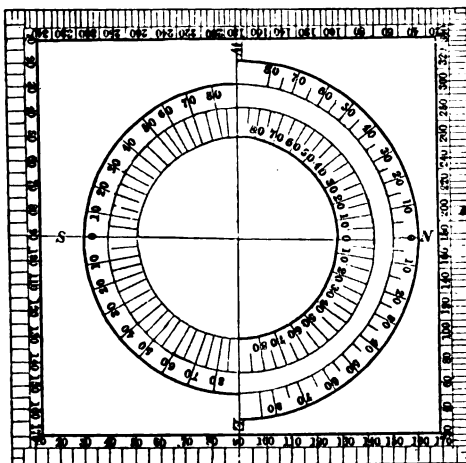


fig 2



19356

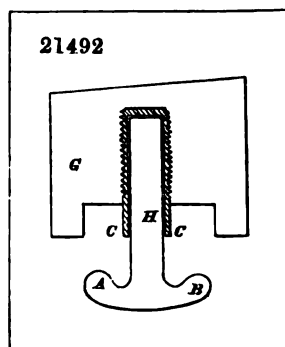
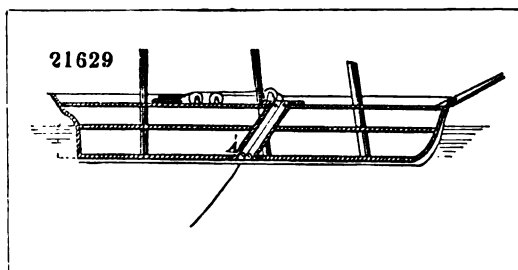
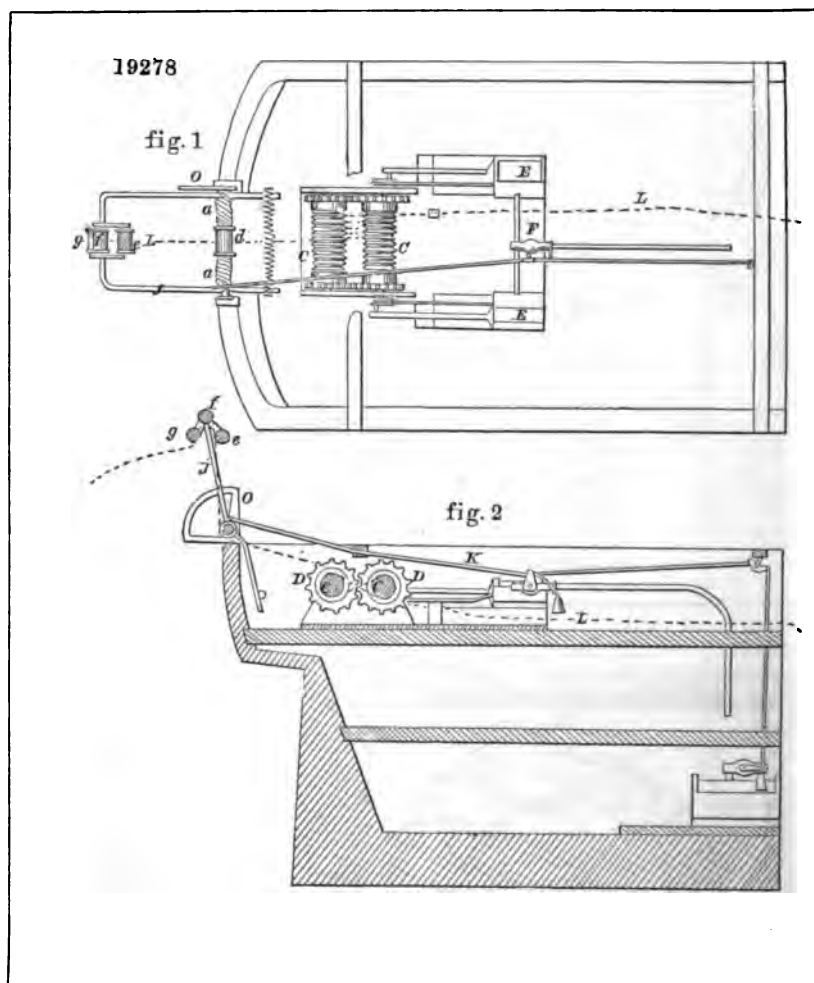


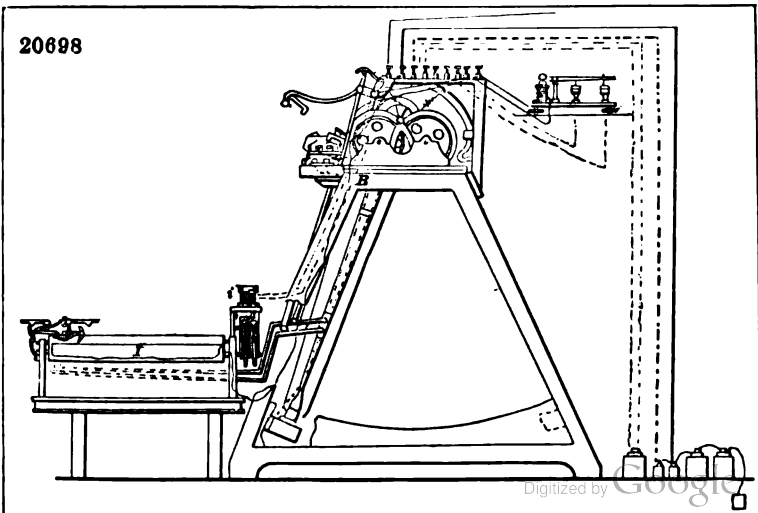
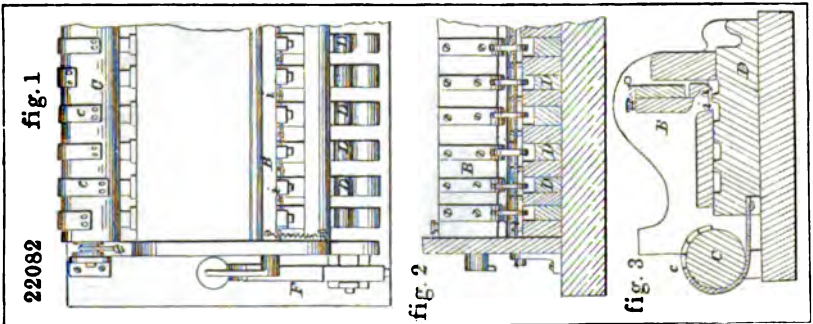
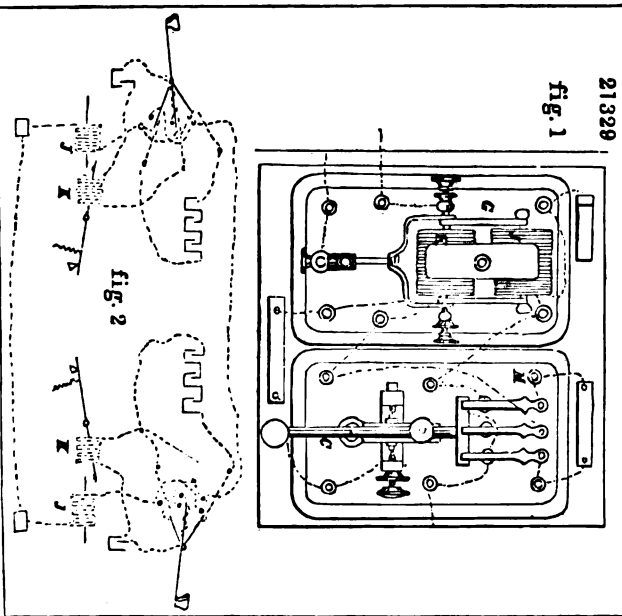
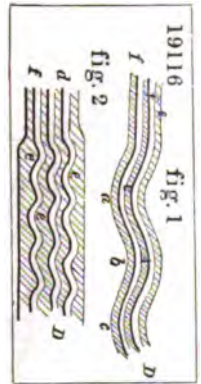
21634



21371









20982

fig. 1

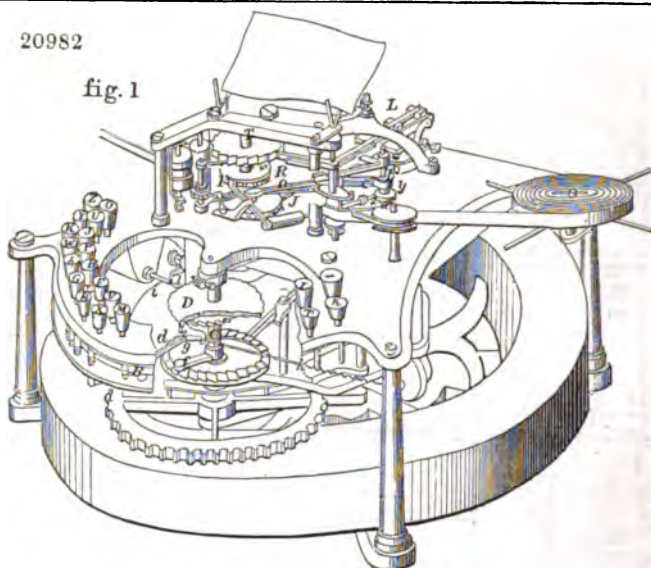
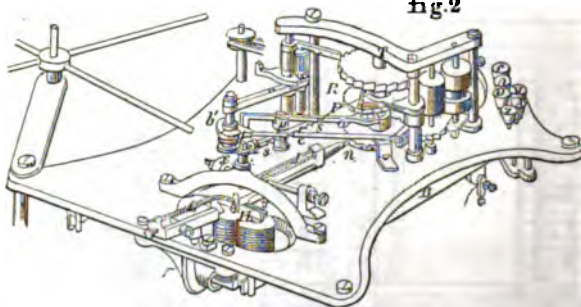


fig. 2



21132

fig. 1

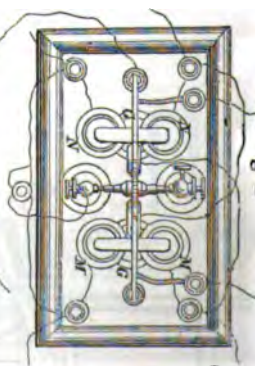


fig. 2

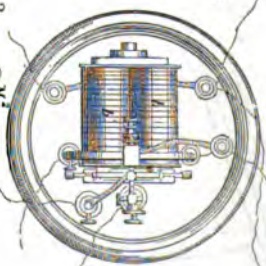
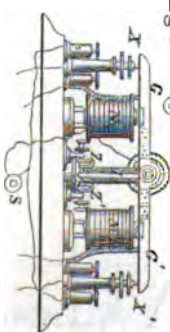
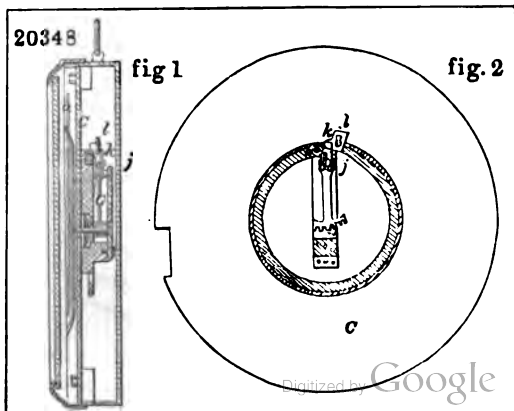
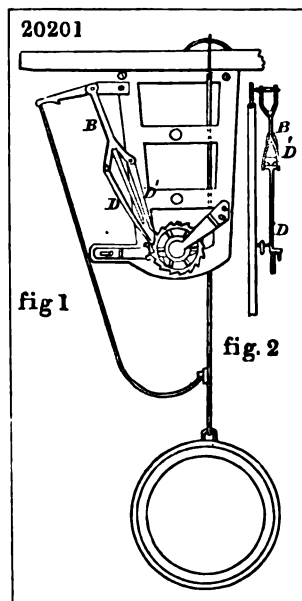
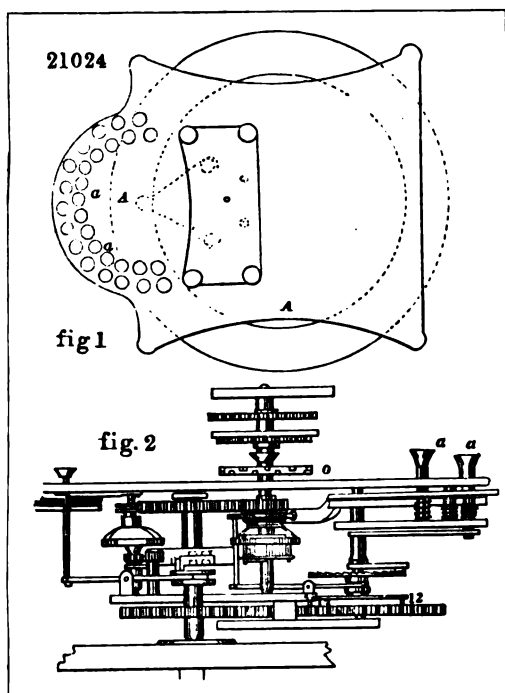
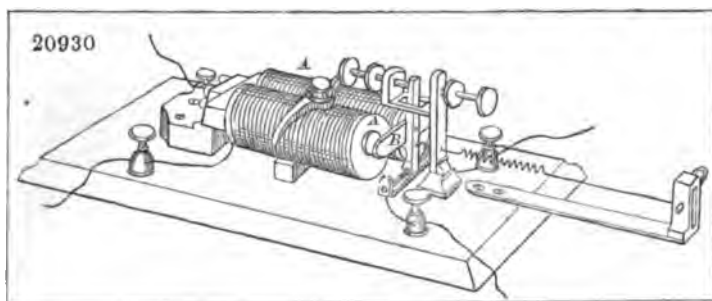
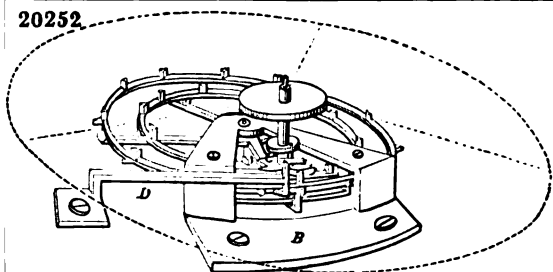


fig. 3

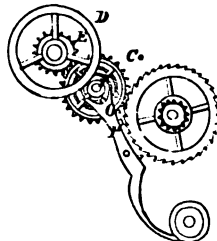




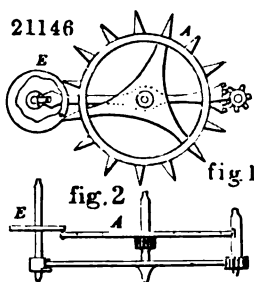
20252



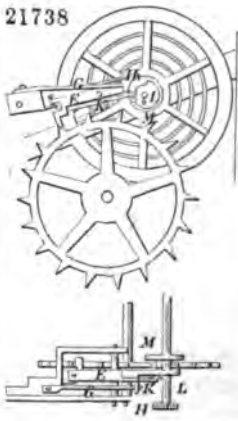
21425



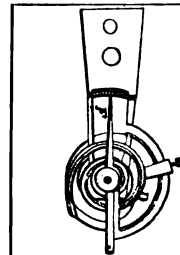
21146



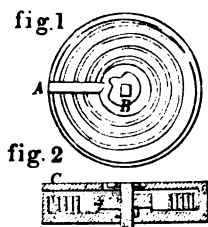
21738



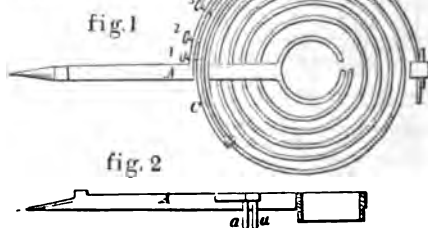
22428



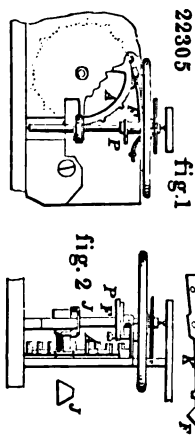
22110



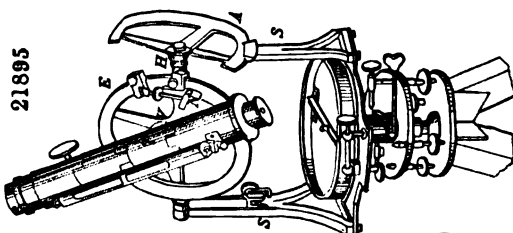
19744



22305



21895



19966

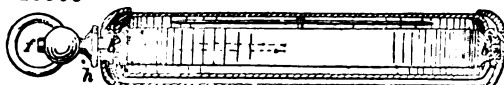


fig. 2

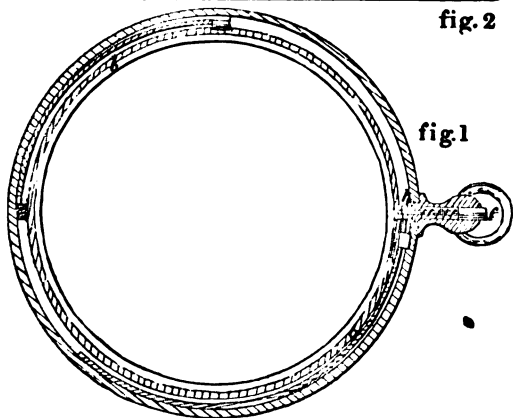


fig. 1

20554

fig. 1.

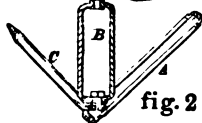


fig. 2

20942

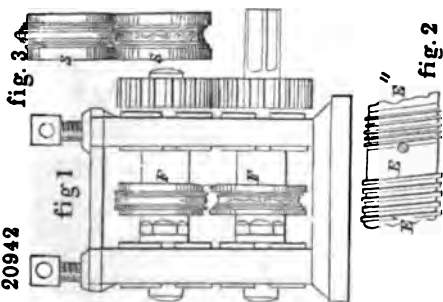
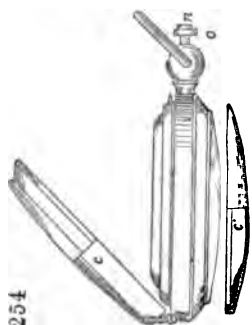


fig. 2.

fig. 2

22254



19972

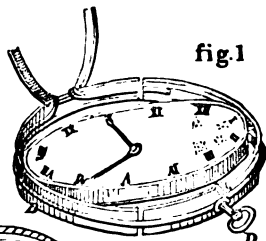


fig. 1

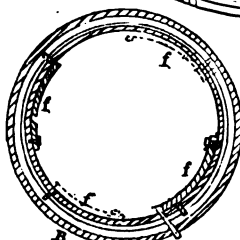


fig. 2

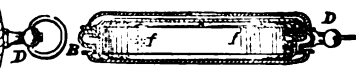
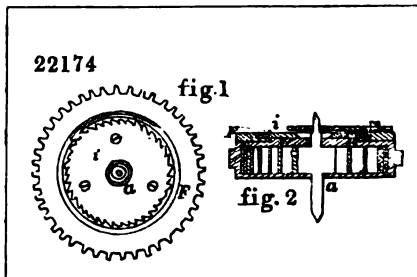
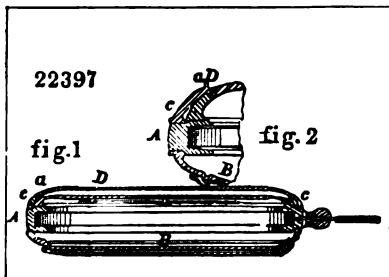
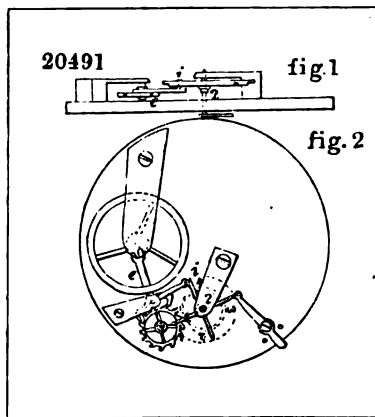
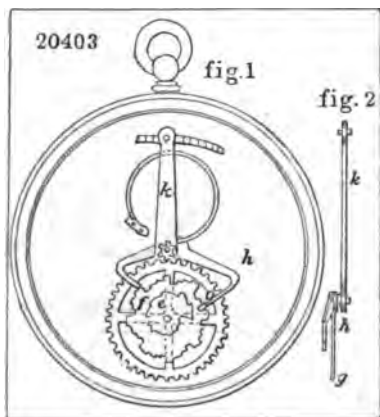
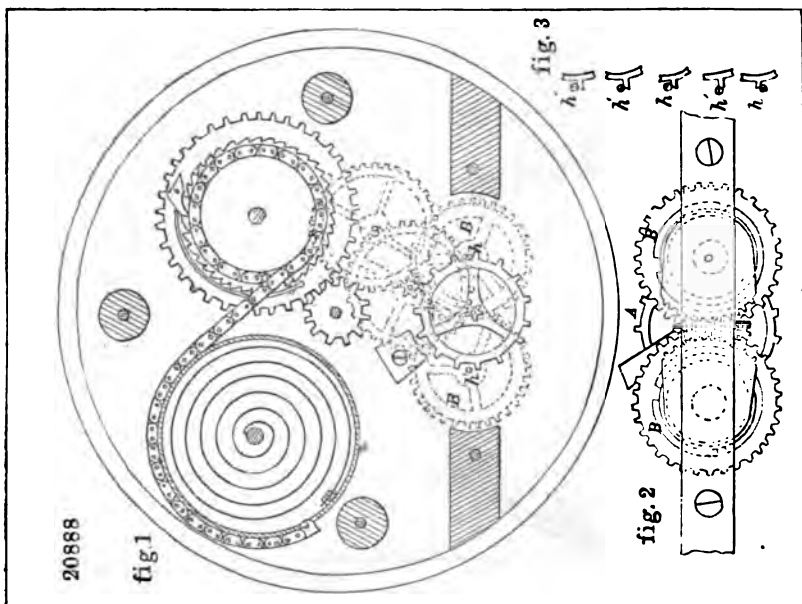


fig. 3



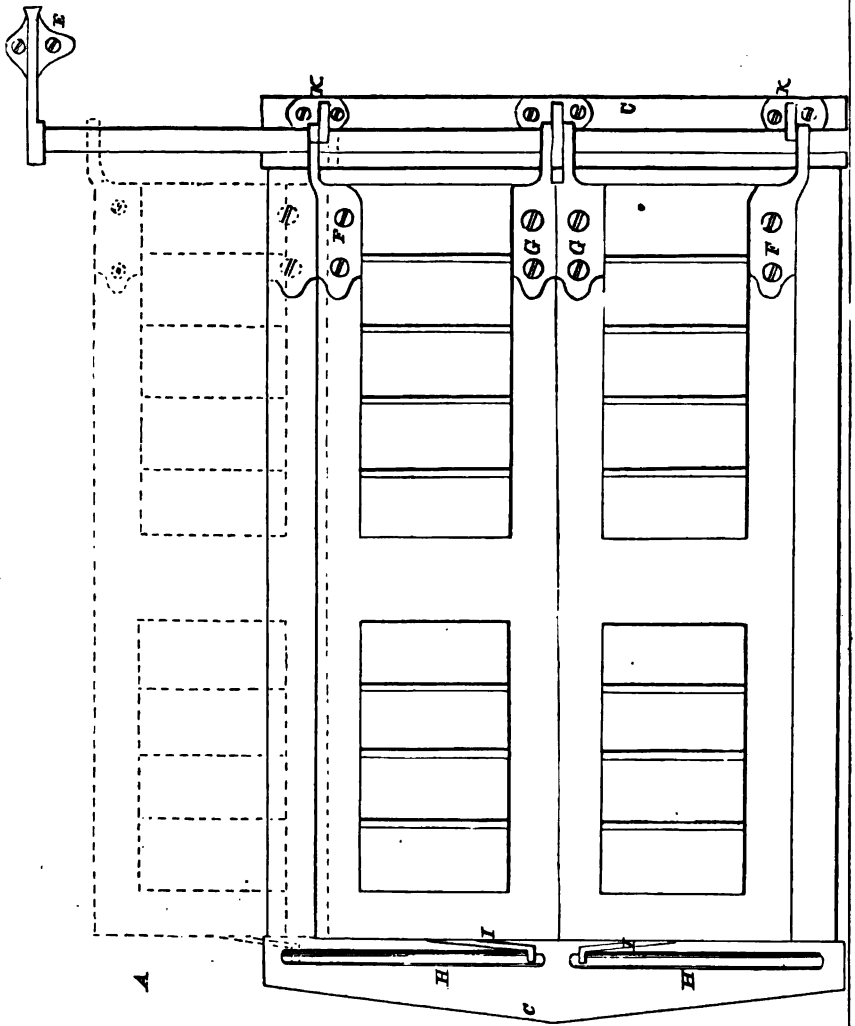


fig. 1

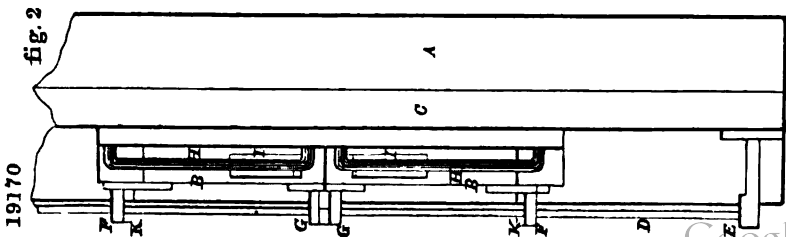


fig. 2

19170

21292

fig. 1

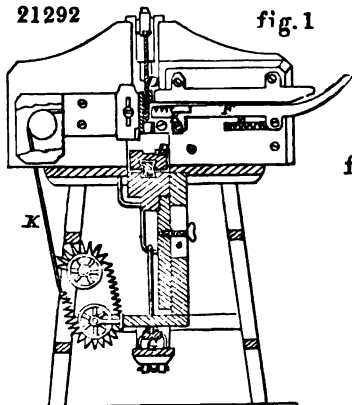


fig. 2

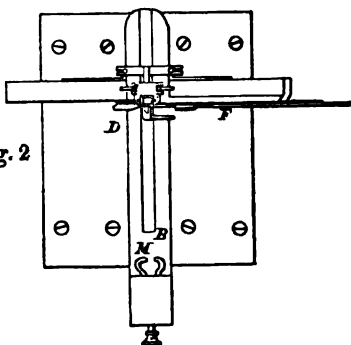
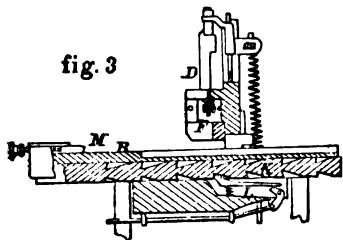
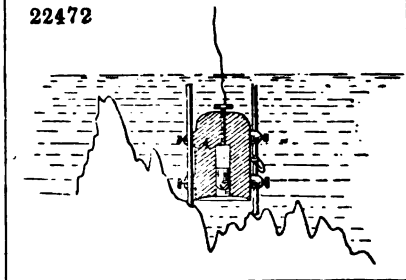


fig. 3



22472



19795

fig. 1

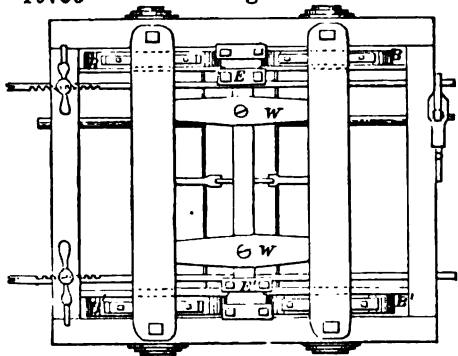
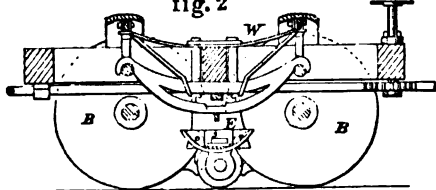
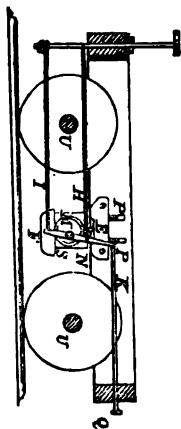


fig. 2



22280



20396

fig. 1

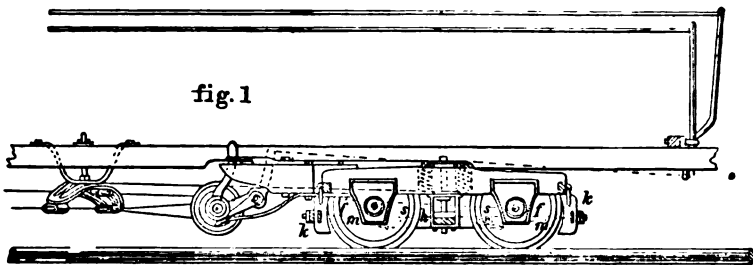
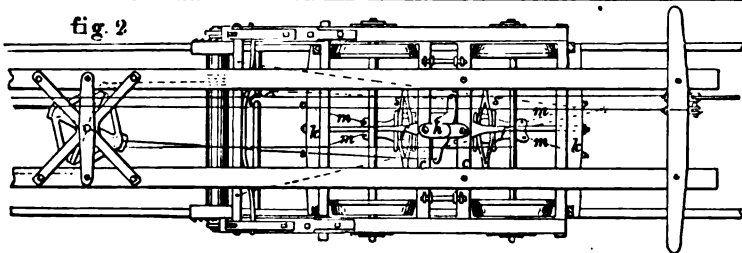


fig. 2



20105

fig. 1

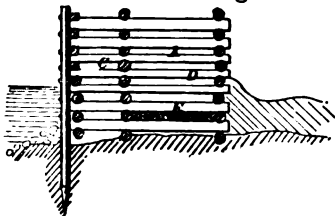
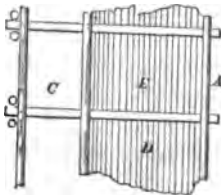
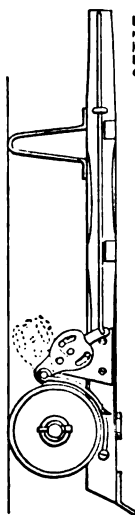


fig. 2



21120



20414

fig. 1

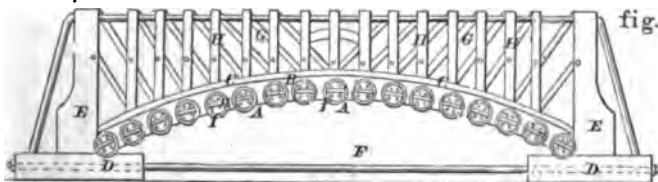
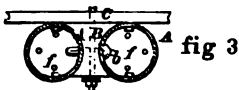
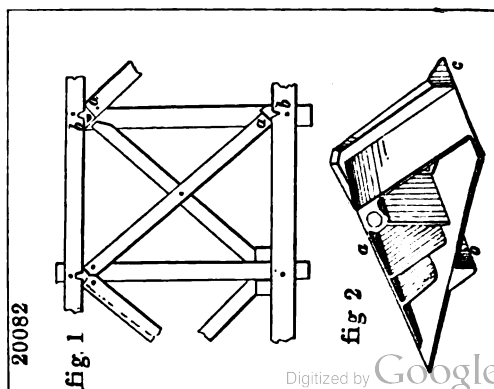
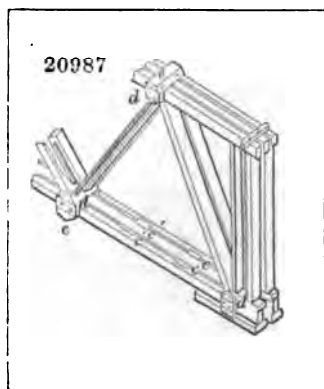
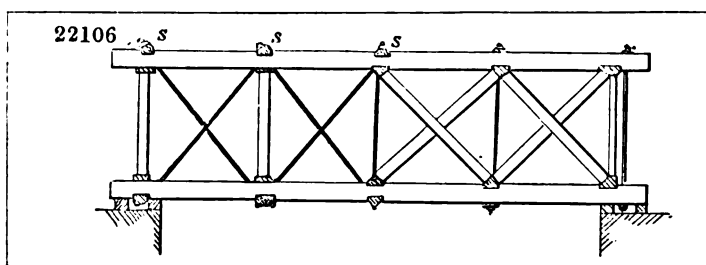
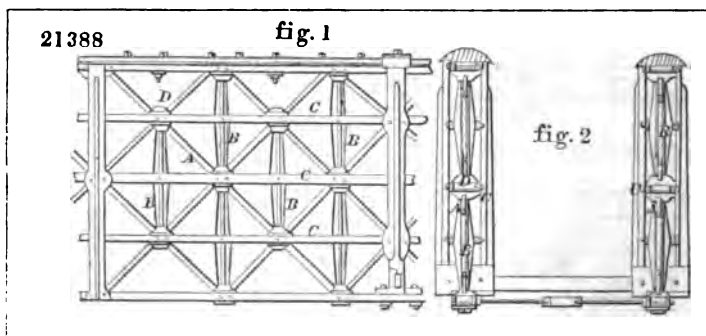
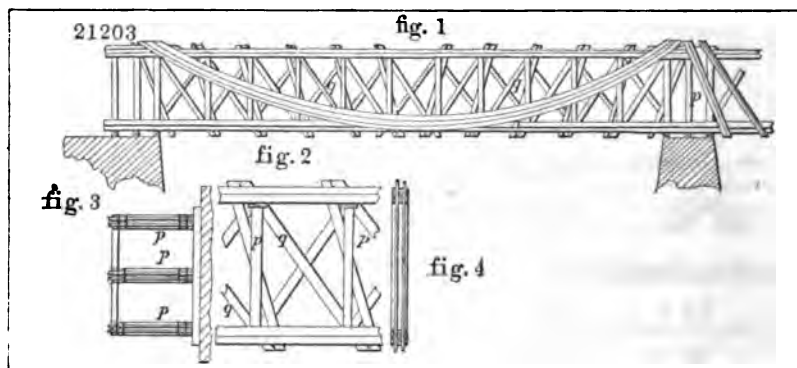
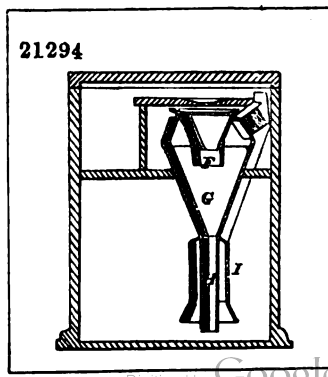
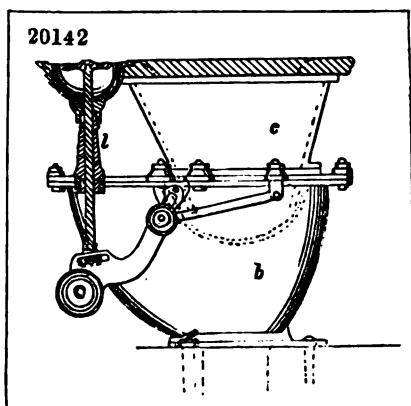
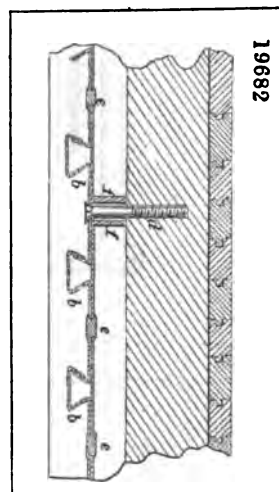
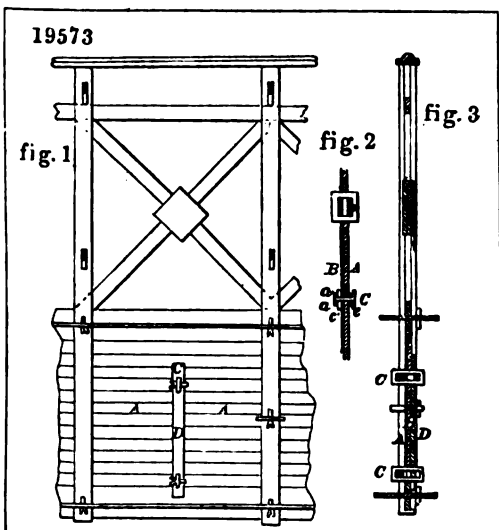
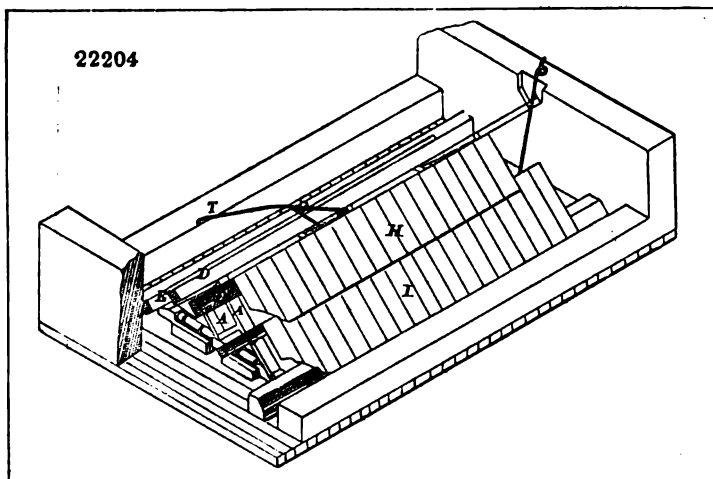


fig. 2









19375

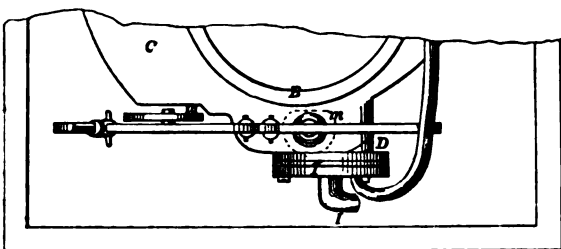
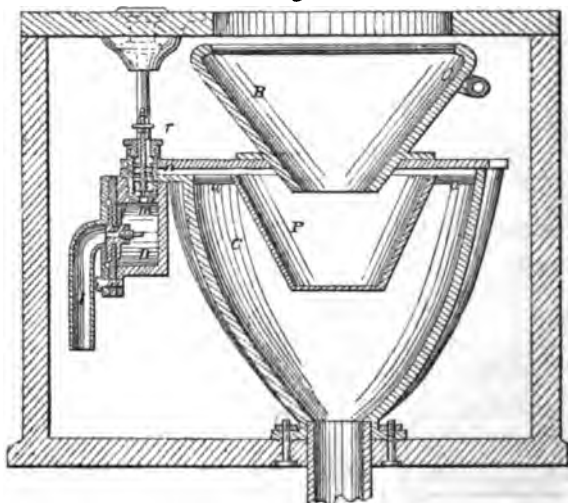
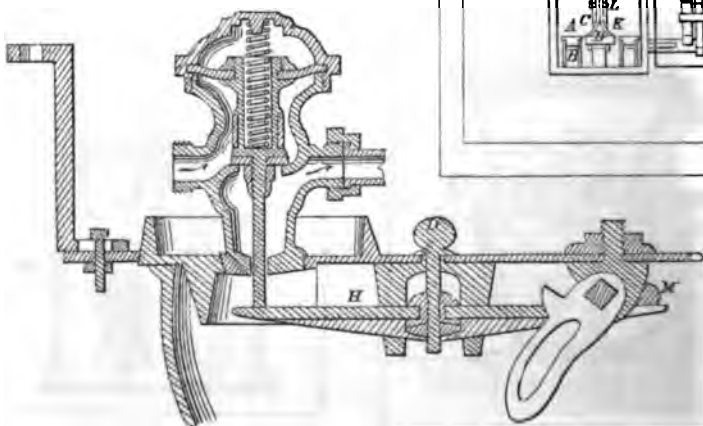


fig. 1

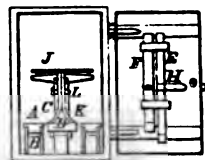
fig. 2

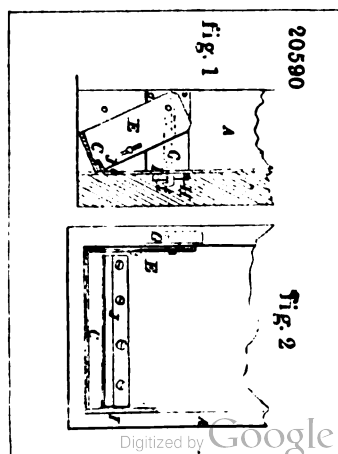
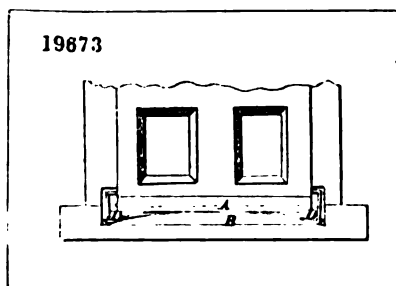
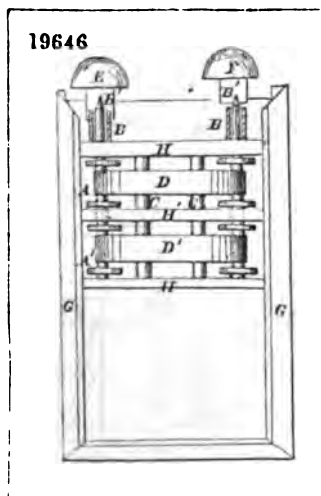
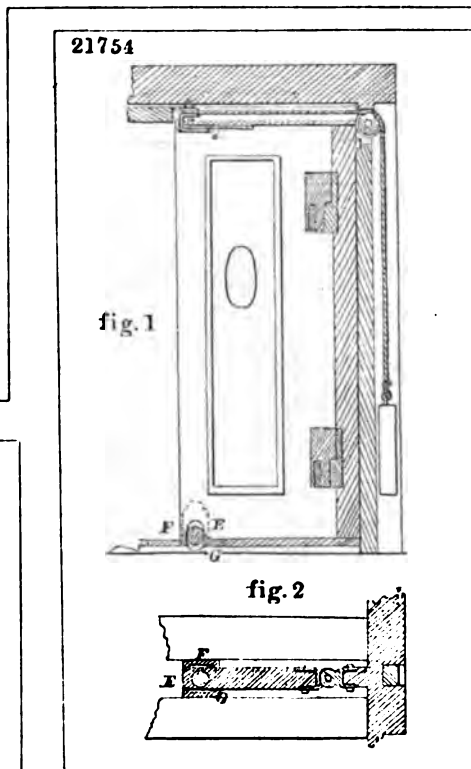
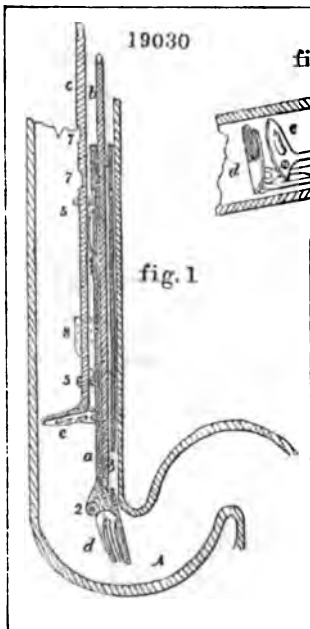


21734



21407





19217

fig. 1

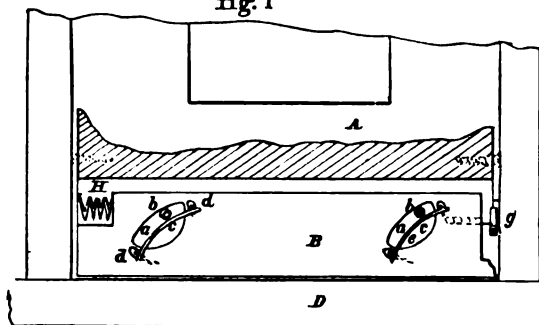
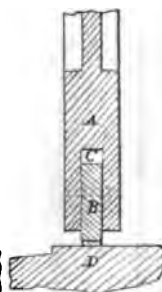


fig. 2



22052

fig. 1

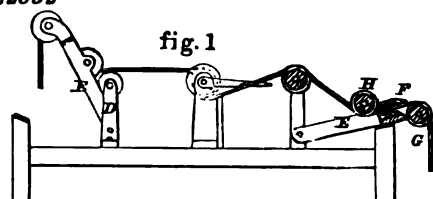
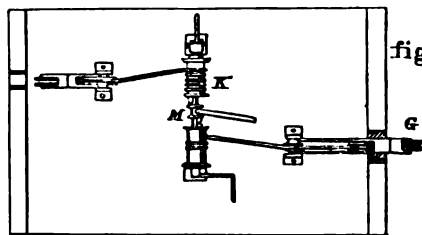
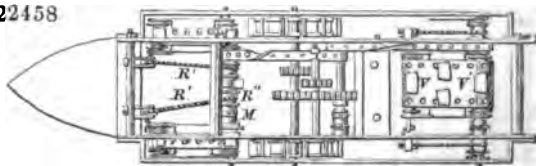


fig. 2



22458



21613

fig. 2

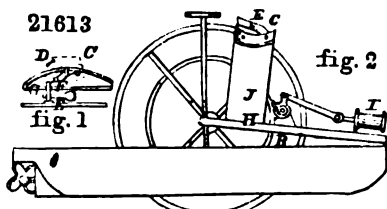
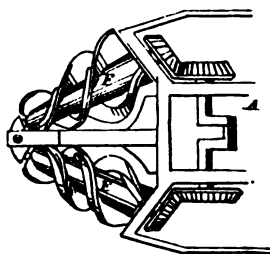


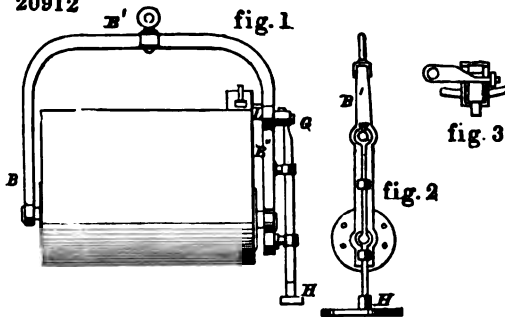
fig. 3



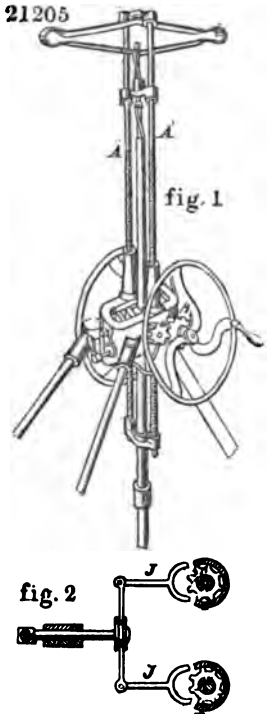
19908



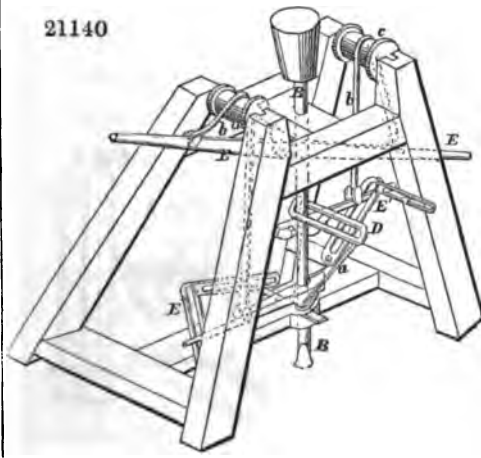
20912



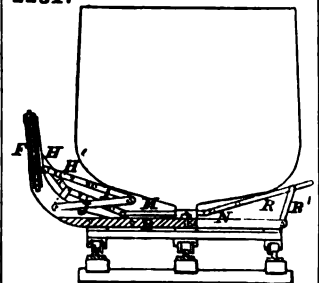
21205



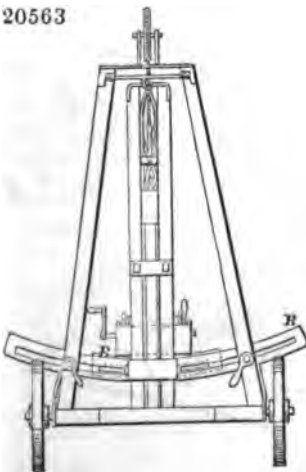
21140



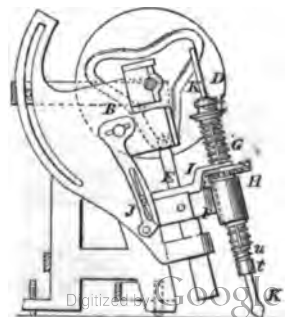
22317



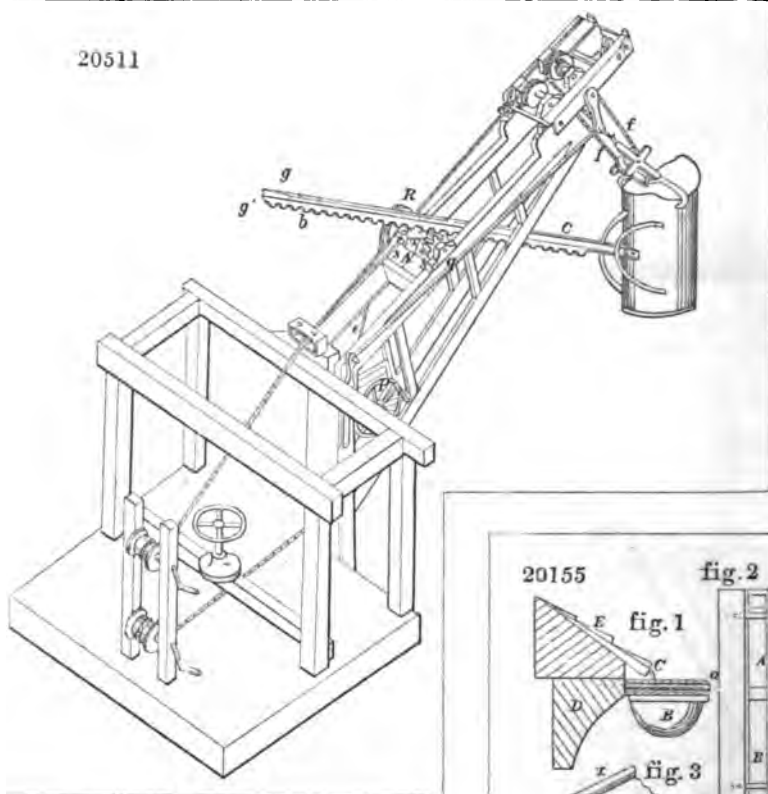
20563



22046

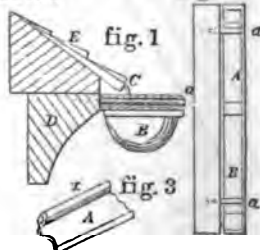


20511



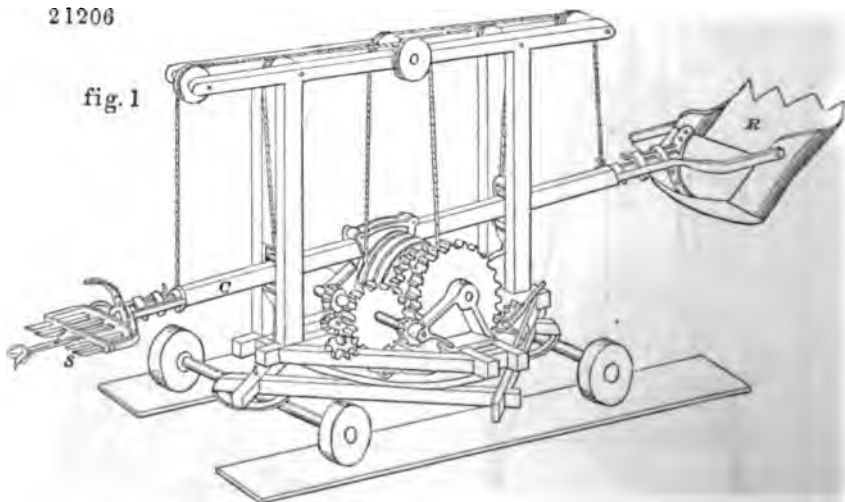
20155

fig. 2

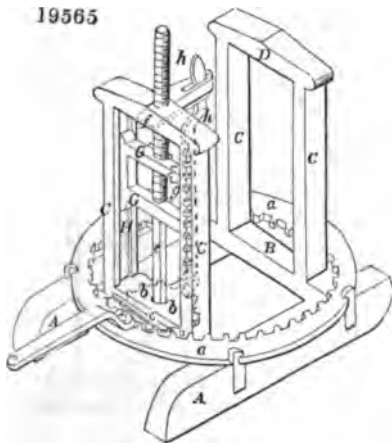


21206

fig. 1



19565



22279

fig. 1

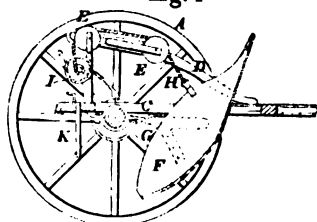
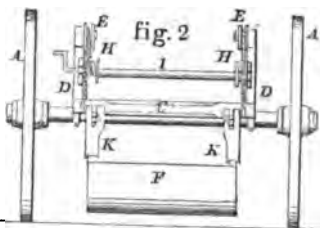
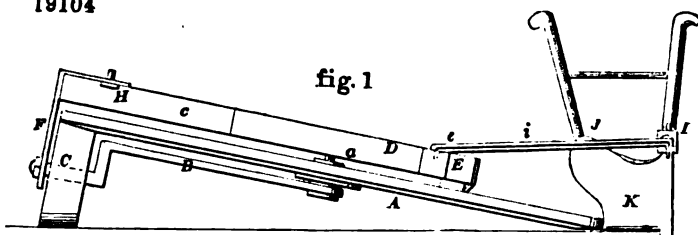


fig. 2

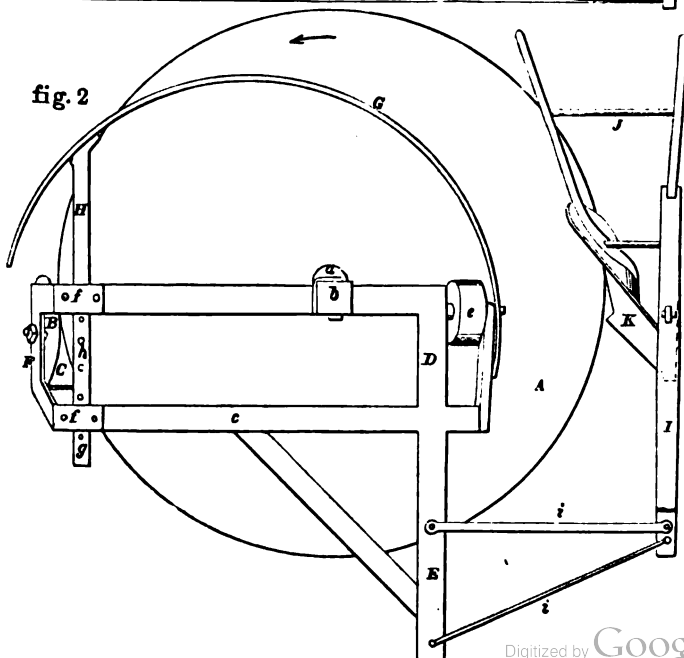


19104

**fig. 1**



**fig. 2**





19353

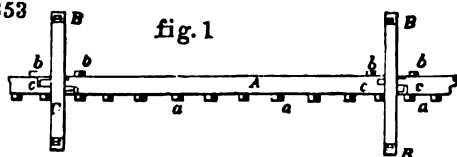


fig. 2

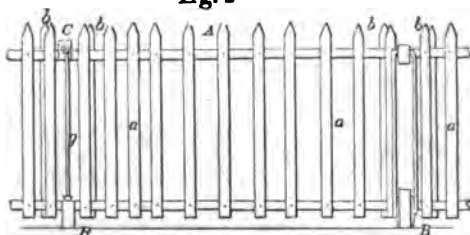
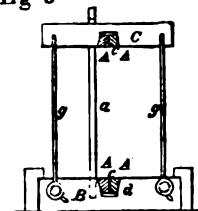


fig. 3



19491

fig. 1

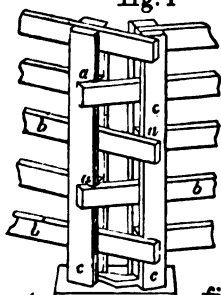
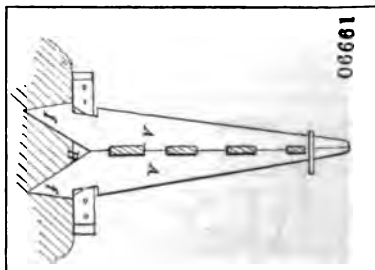
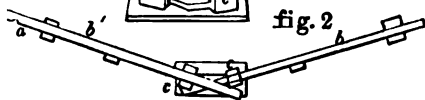
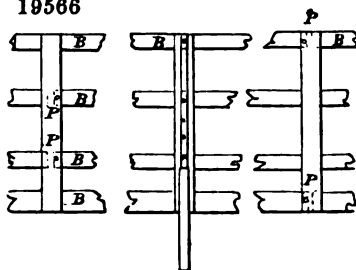


fig. 2



06681

19566



20599

fig. 1

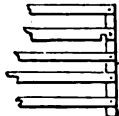
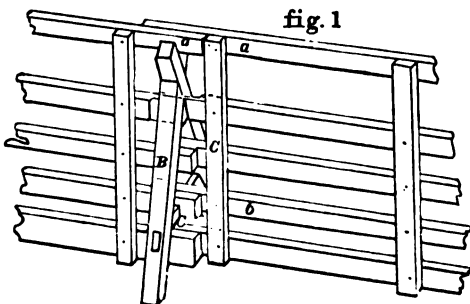


fig. 2



fig. 1

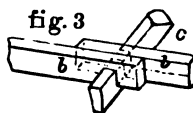


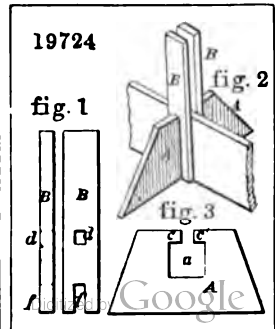
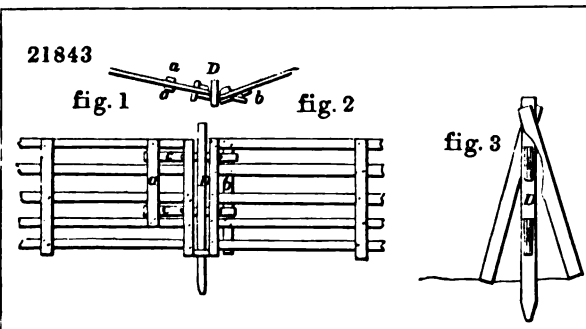
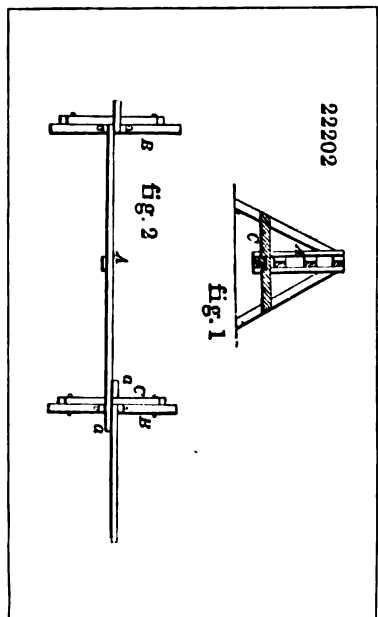
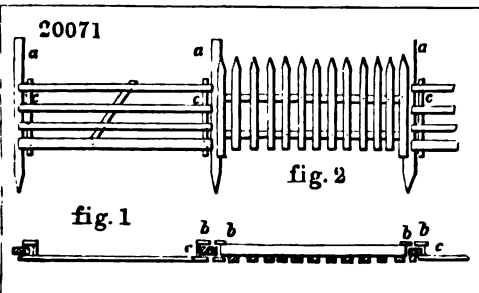
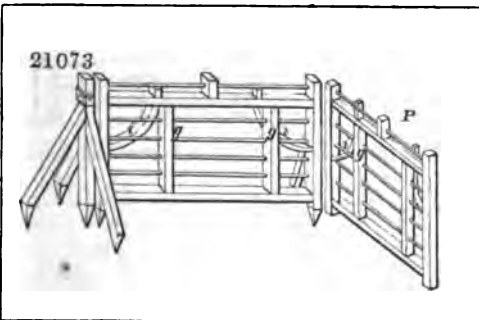
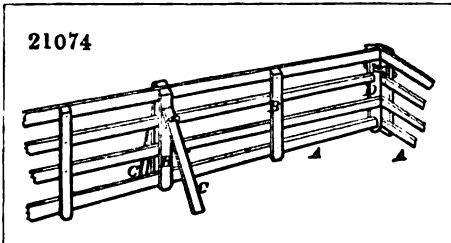
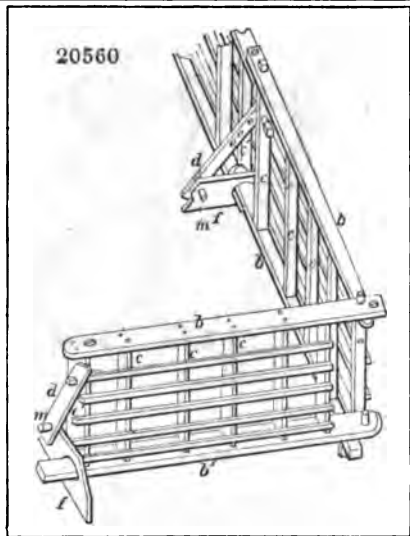
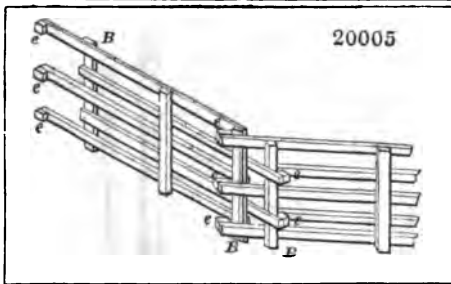
19873

fig. 2

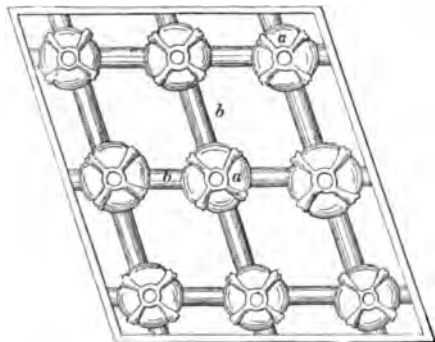


fig. 3





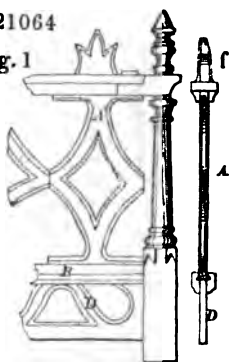
20400



21064

fig. 1

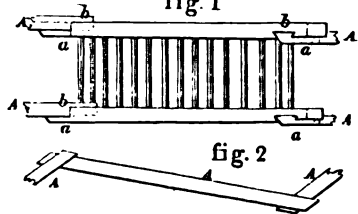
fig. 2



21315

fig. 1

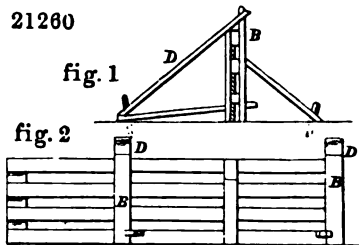
fig. 2



21280

fig. 1

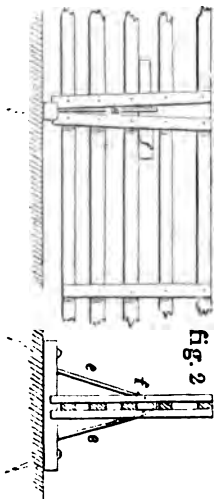
fig. 2



21549

fig. 1

fig. 2

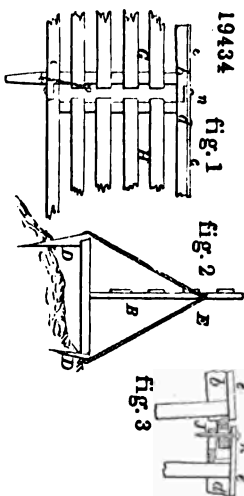


19434

fig. 1

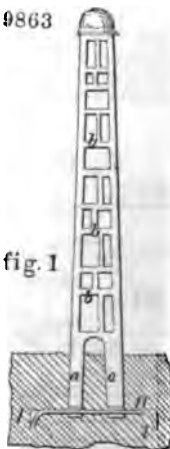
fig. 2

fig. 3



19863

fig. 1



21529

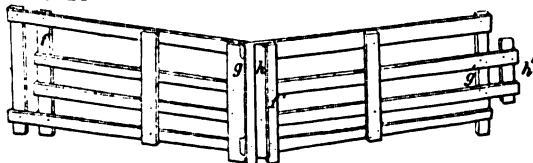


fig. 2 by Google

19159

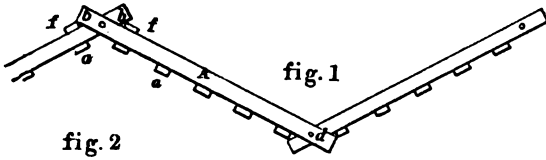
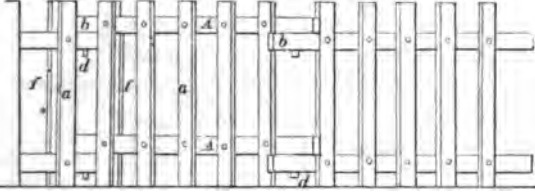


fig. 2



21459

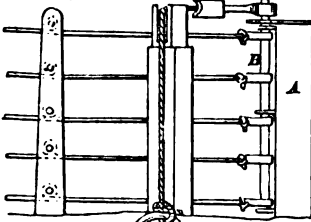
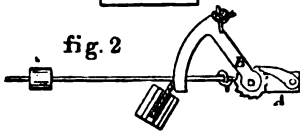
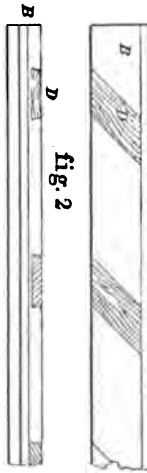


fig. 2



B  
D  
fig. 2

19174  
fig. 1



21037

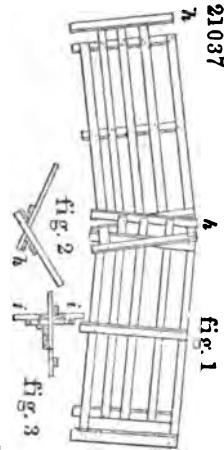
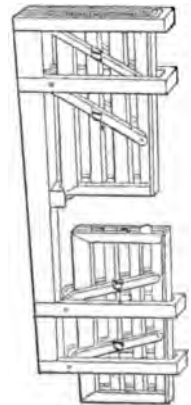


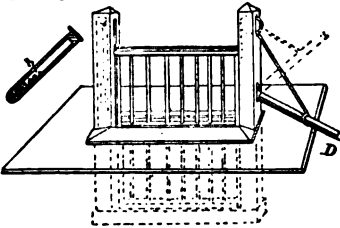
fig. 2

fig. 3

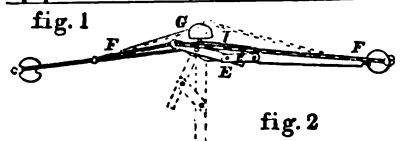
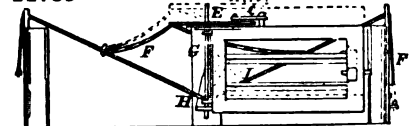
21526



21645



21785



19499

fig. 1

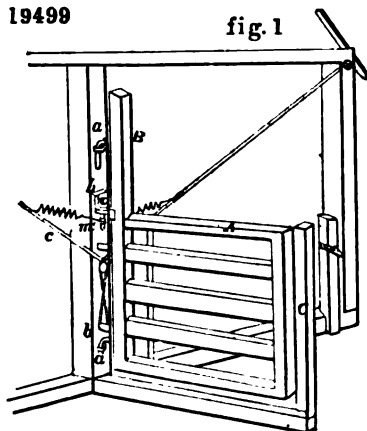
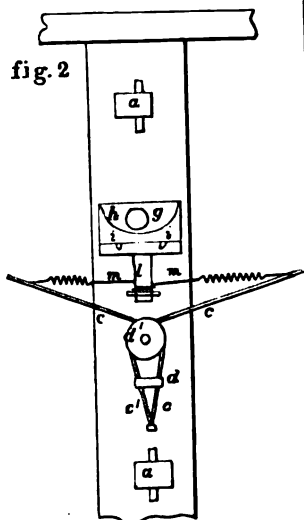
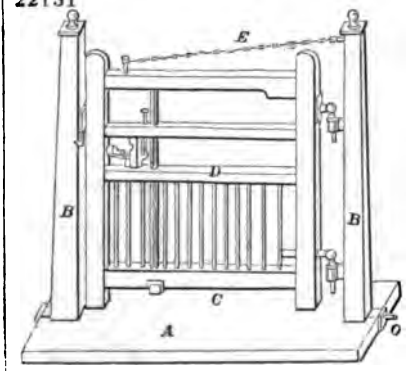


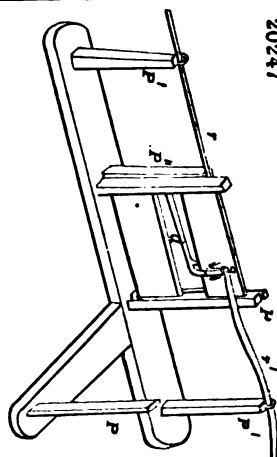
fig. 2



22131



20247



20008

fig. 1 fig. 2

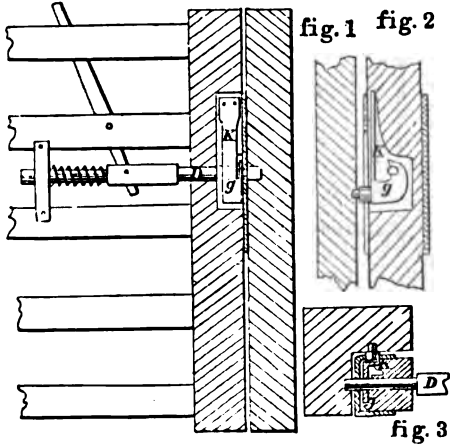
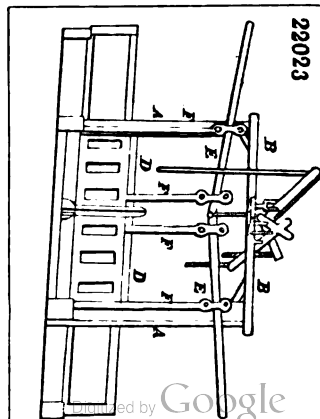
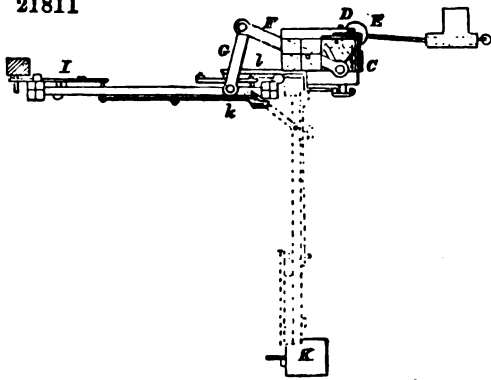


fig. 3

22023



21811



20011

fig. 1

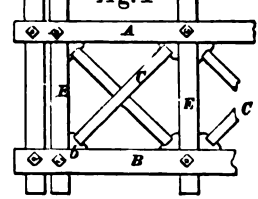


fig. 2

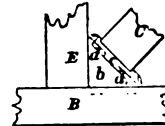
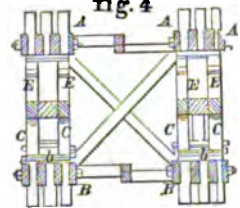


fig. 3

fig. 4



18630

fig. 1

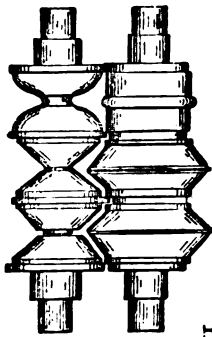
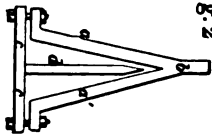
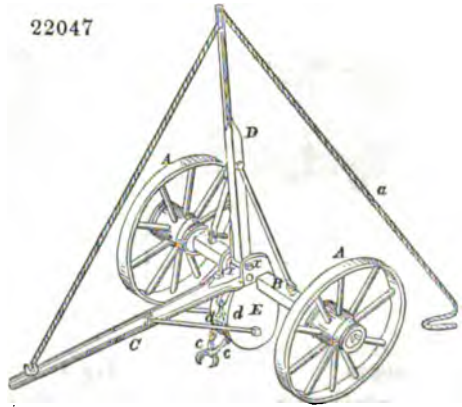


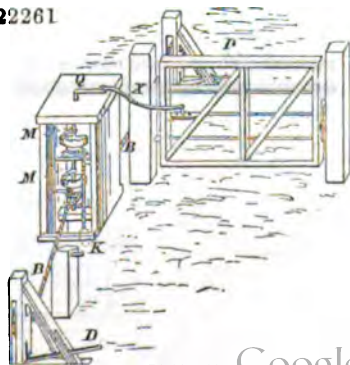
fig. 2



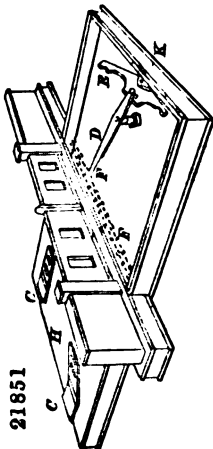
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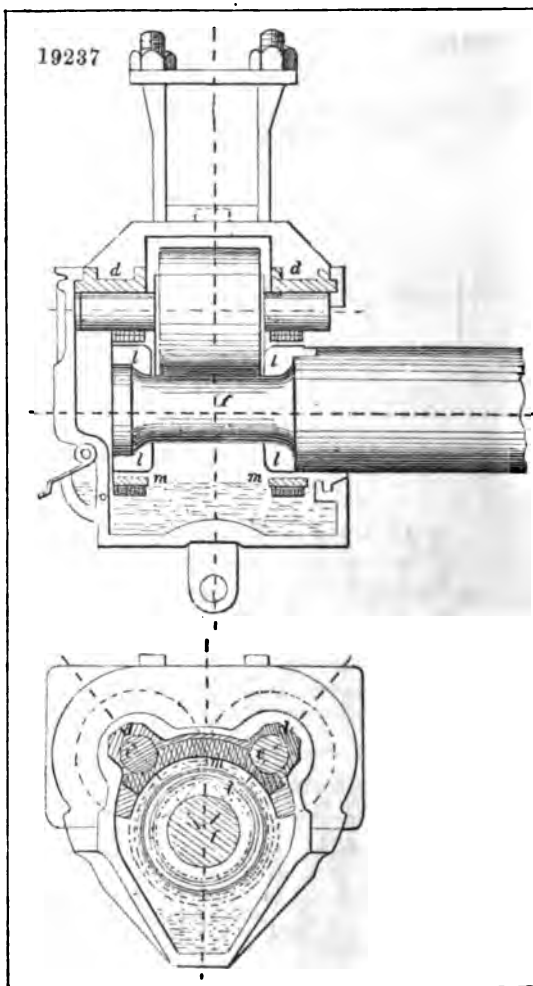
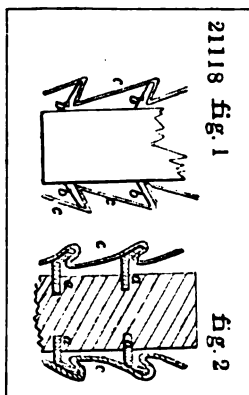
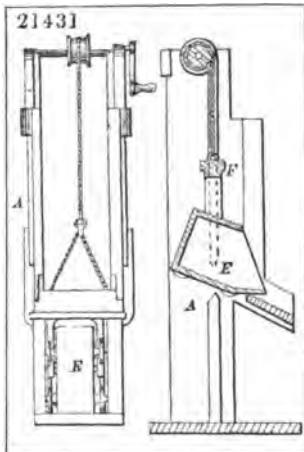


22261



21851





20629

fig. 1

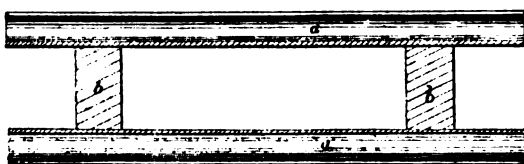
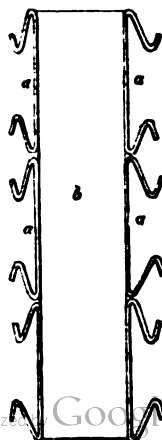


fig. 2



21908

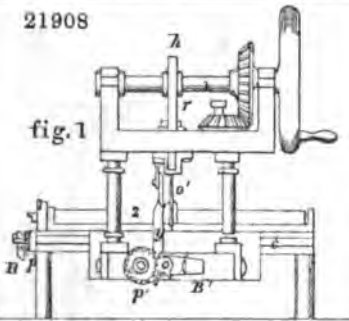


fig. 1

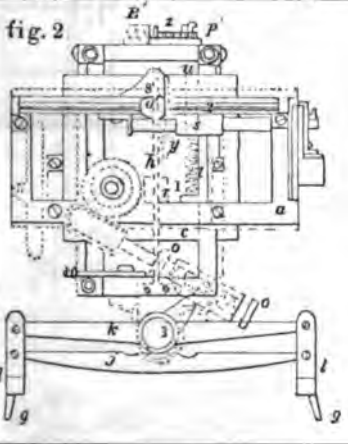
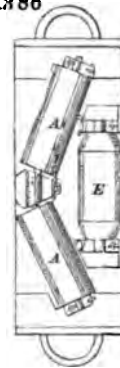


fig. 2

21386



19487 fig. 1

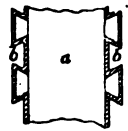


fig. 2

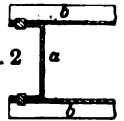


fig. 3



10592

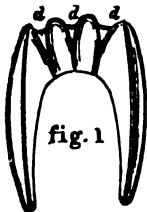


fig. 1

fig. 2



fig. 2

fig. 1

22444

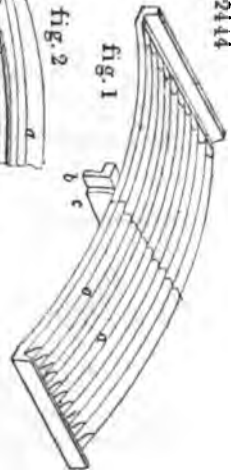


fig. 3

10543

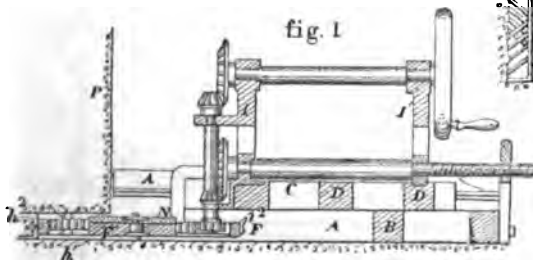
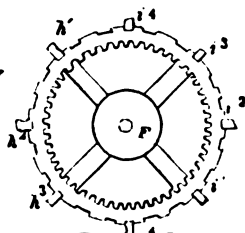


fig. 1

fig. 3

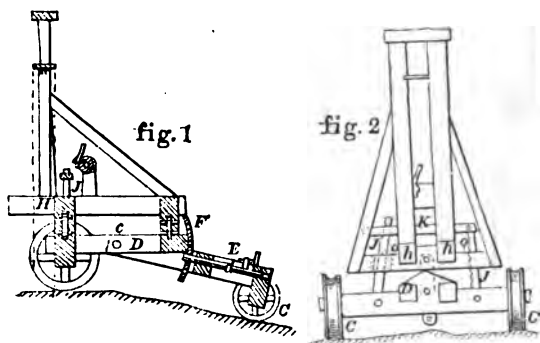


fig. 2

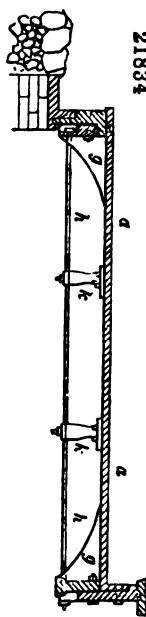




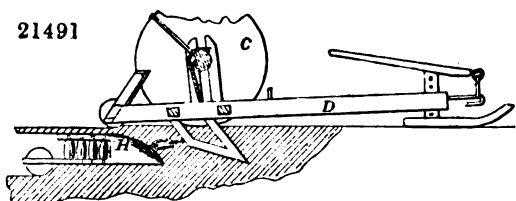
20883



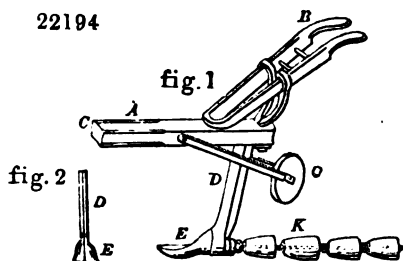
21834



21491



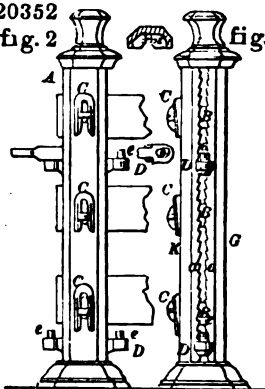
22194



20352

fig. 2

fig. 1



21750

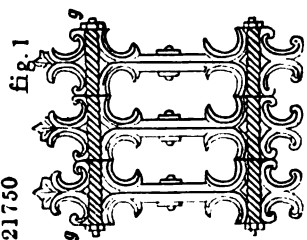
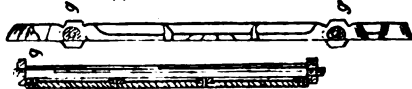


fig. 2



22448 fig. 1

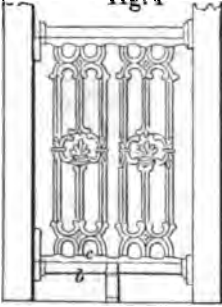
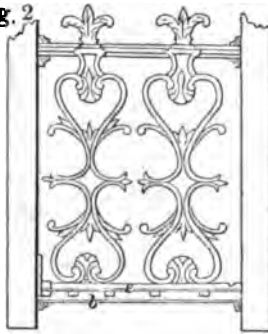
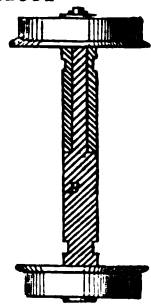


fig. 2



21604



20797

fig. 1

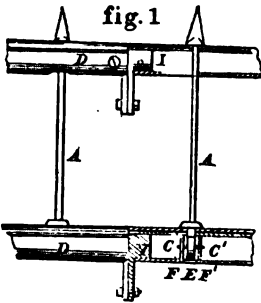
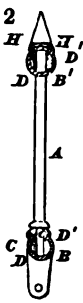
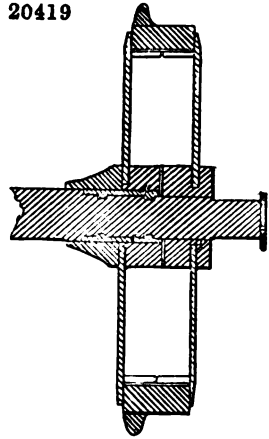


fig. 2



20419



20871

fig. 1

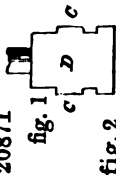
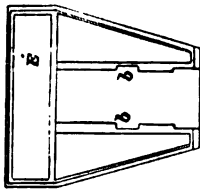


fig. 2



19705

fig. 1

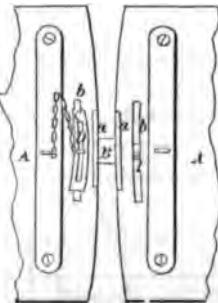
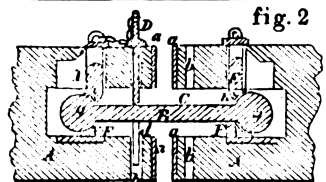


fig. 2



19124 fig. 1

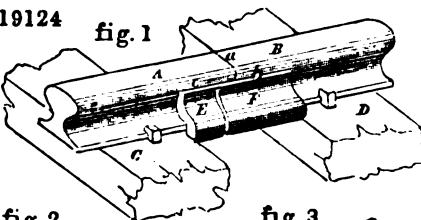


fig. 2

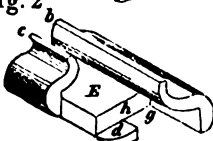
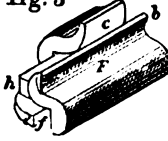
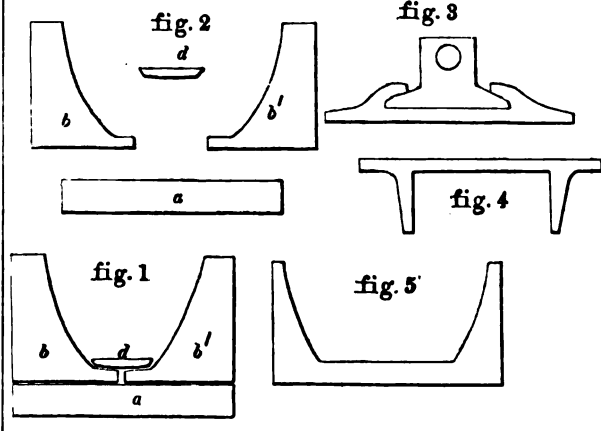


fig. 3

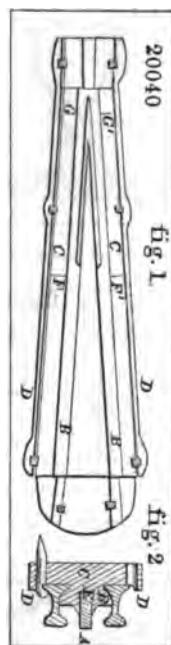
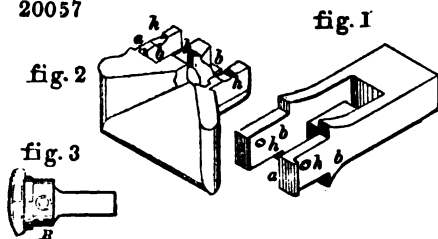




19308



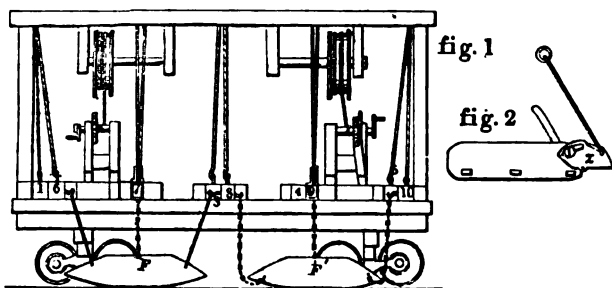
20057



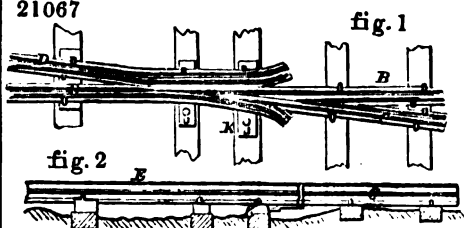
21426



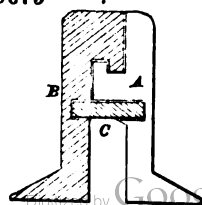
21942



21067



19675

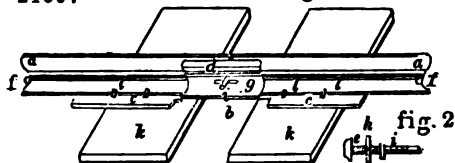


20007



21097

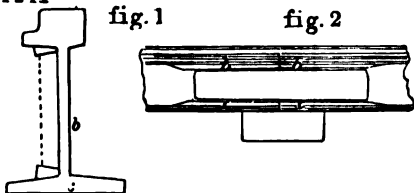
fig. 1



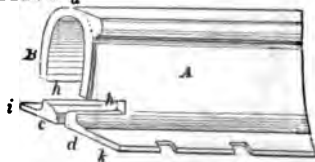
21241

fig. 1

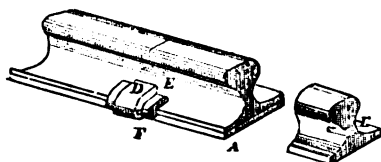
fig. 2



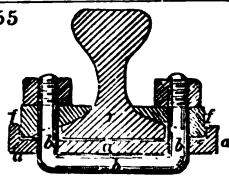
22376



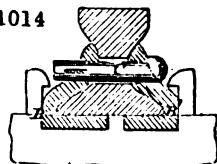
20928



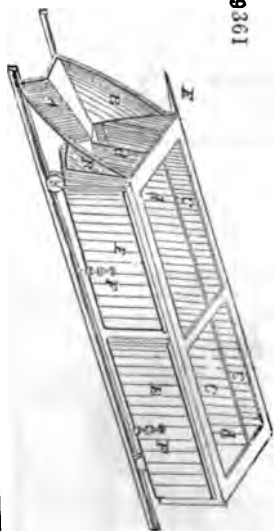
19555



21014



19361



19847

fig. 1

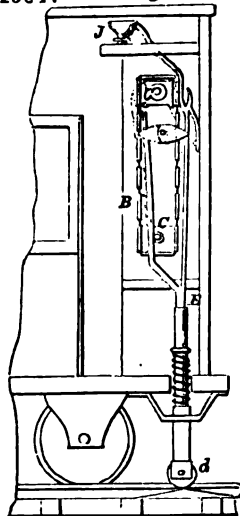
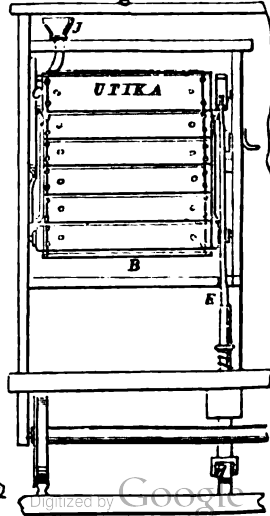
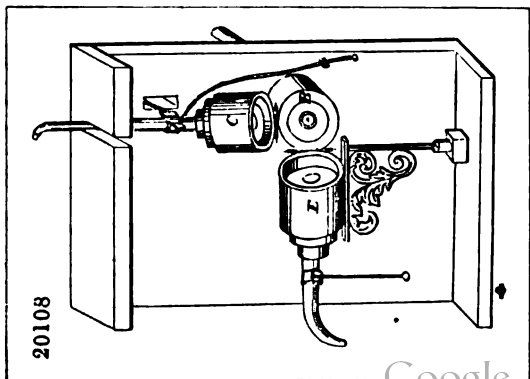
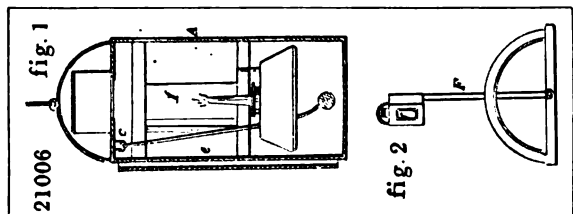
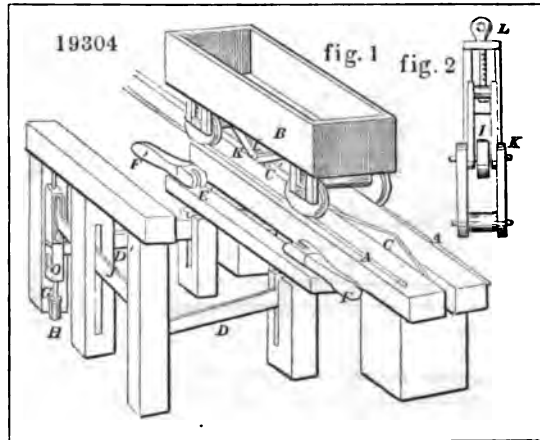
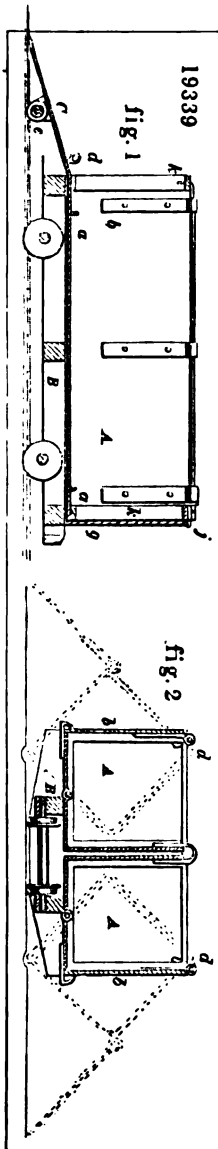
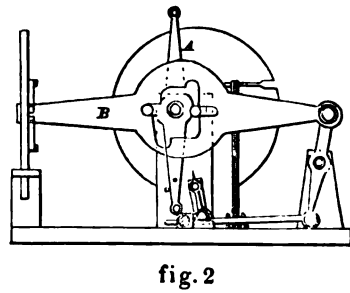
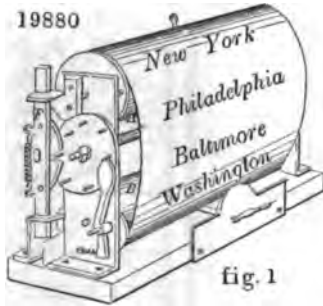
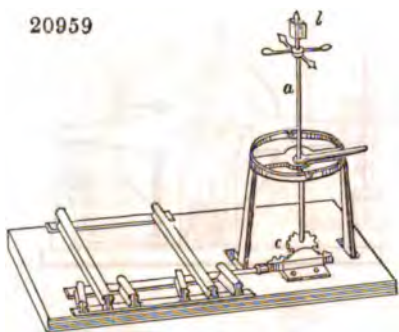


fig. 2





20959



20620

fig. 1



fig. 2



19165

fig. 1

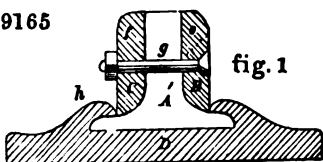


fig. 2

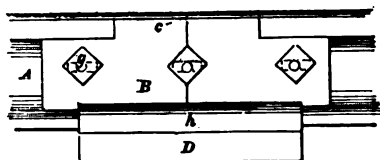
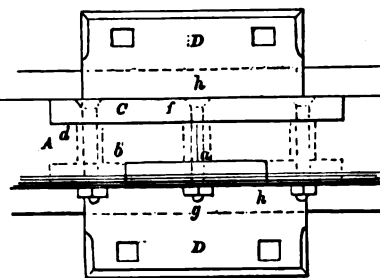


fig. 3



19241

fig. 1

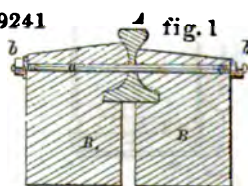
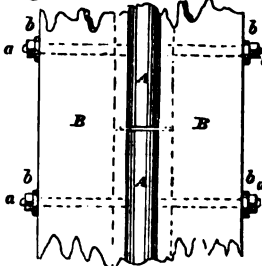


fig. 2



19440

fig. 1

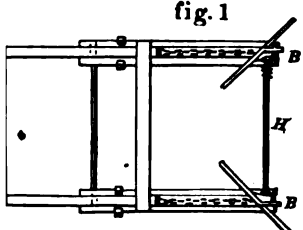
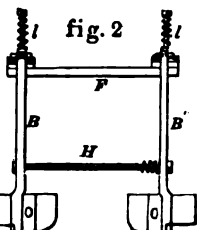
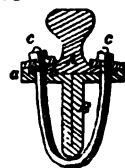
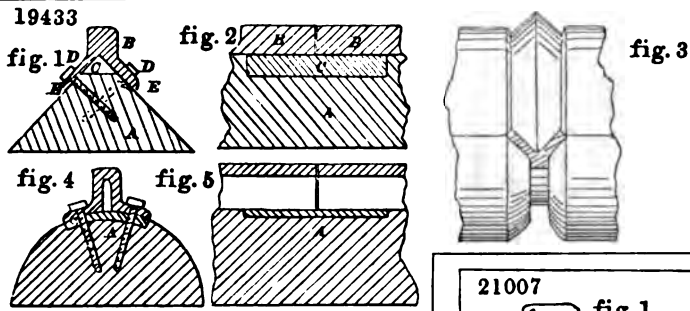


fig. 2

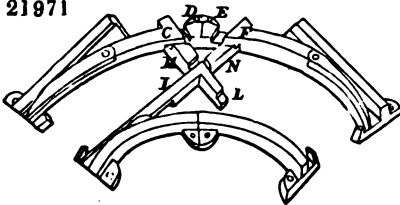


21406

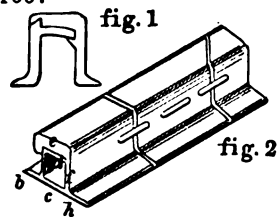




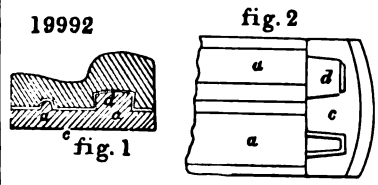
21971



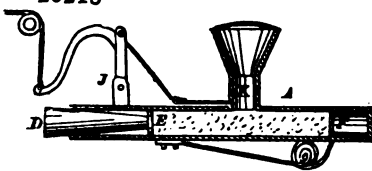
21007



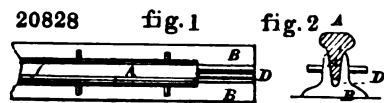
19992



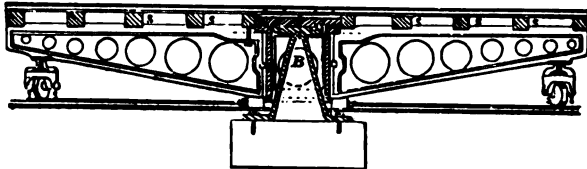
20218



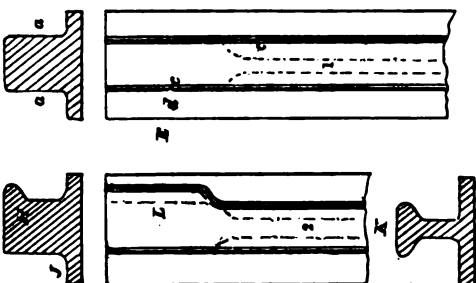
20828



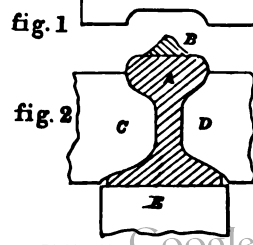
19718



19053



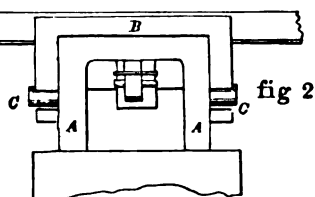
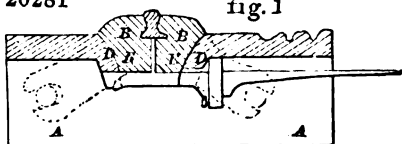
22103





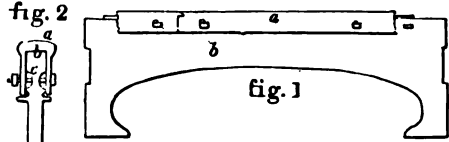
20281

fig. 1



20248

fig. 2



22168

fig. 1

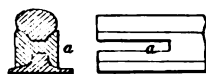
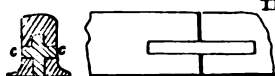


fig. 2



21480

fig. 1

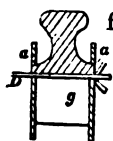
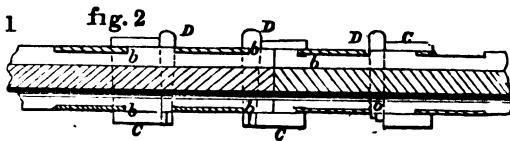


fig. 2



21957

fig. 1

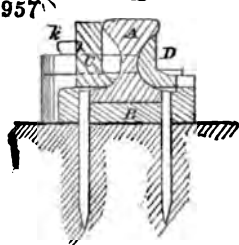
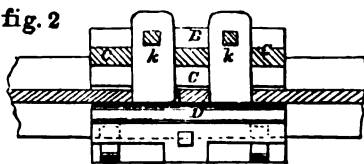


fig. 2



21266

fig. 1

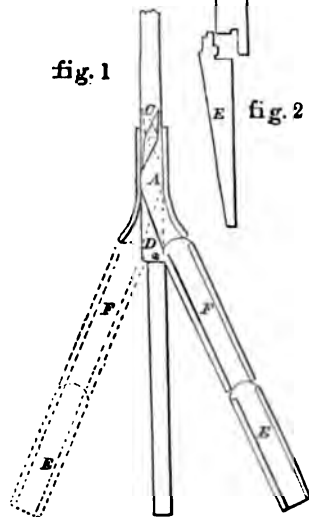
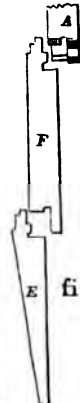
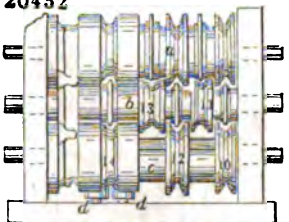


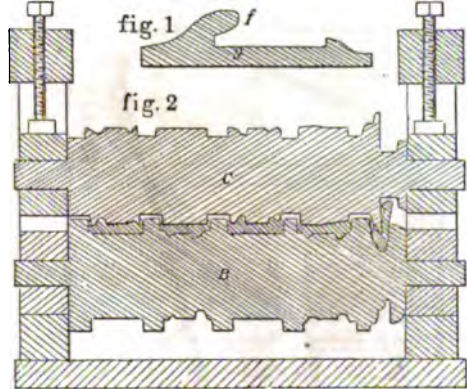
fig. 2



20452



21380



22031

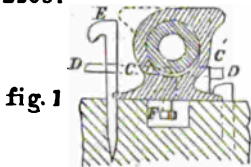
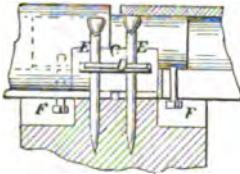


fig. 1

fig. 2



20793

fig. 1

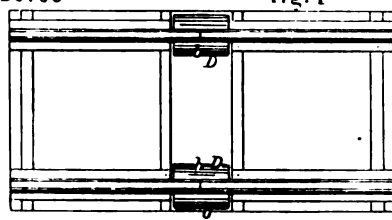
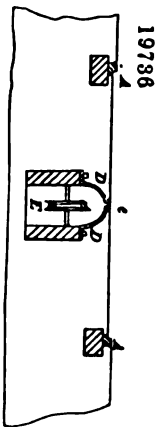
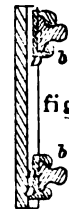


fig. 2



19786

22196

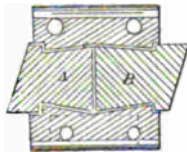
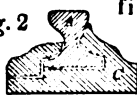


fig. 2

fig. 1



21899

fig. 1



fig. 2

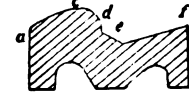


fig. 3



20841 fig. 1

fig. 2



19704

fig. 1

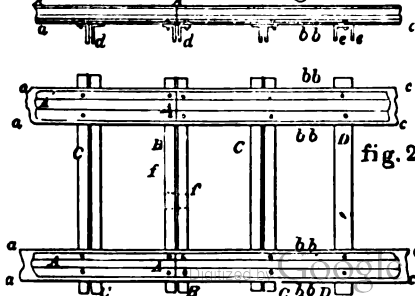
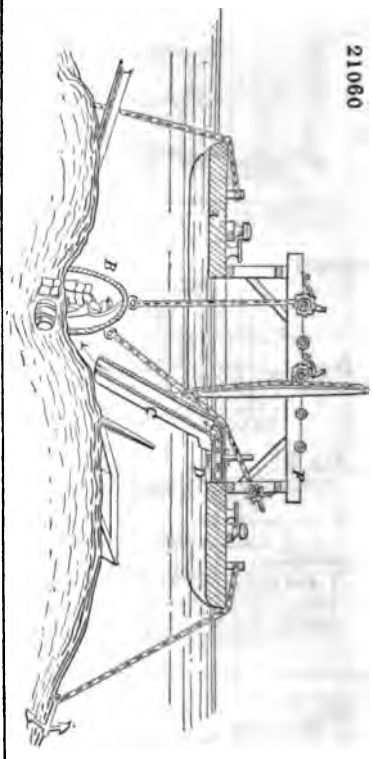
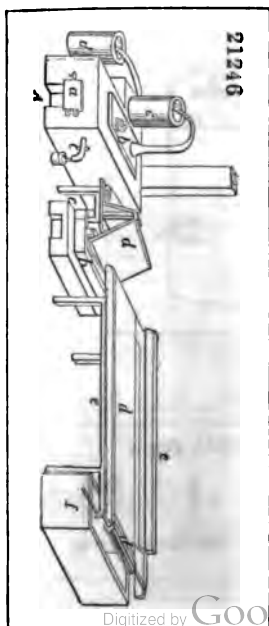


fig. 2

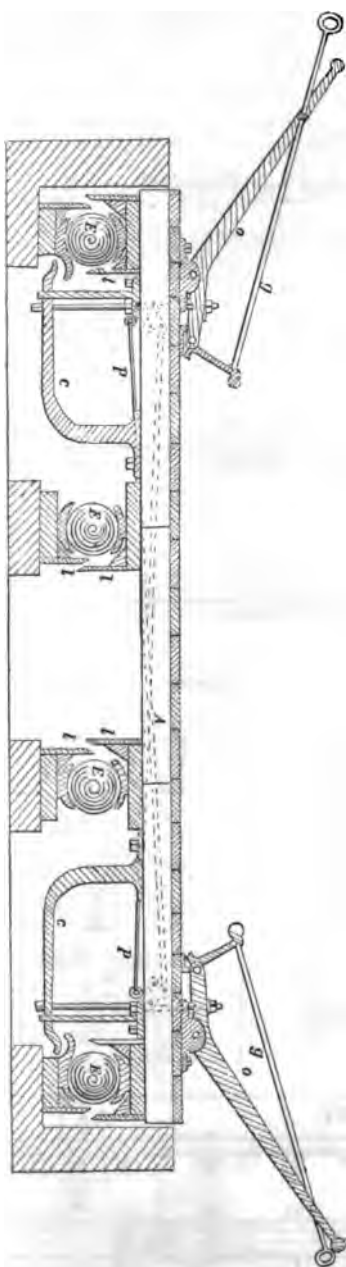
21060



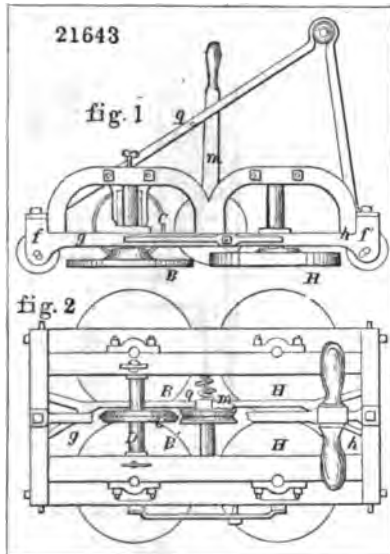
21246



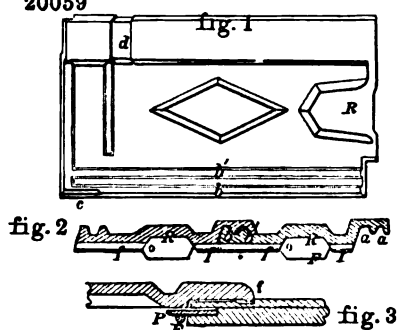
19268



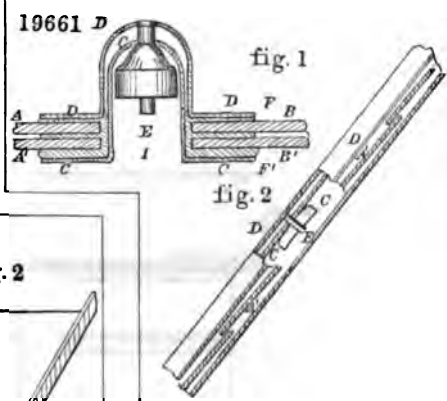
21643



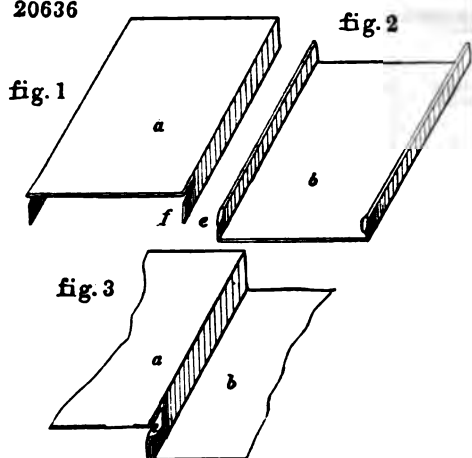
20059



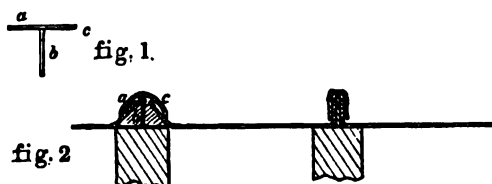
19661



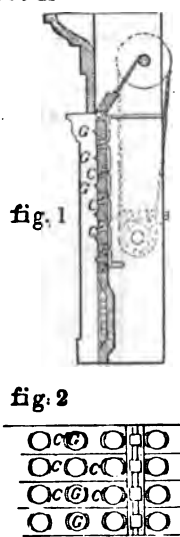
20636

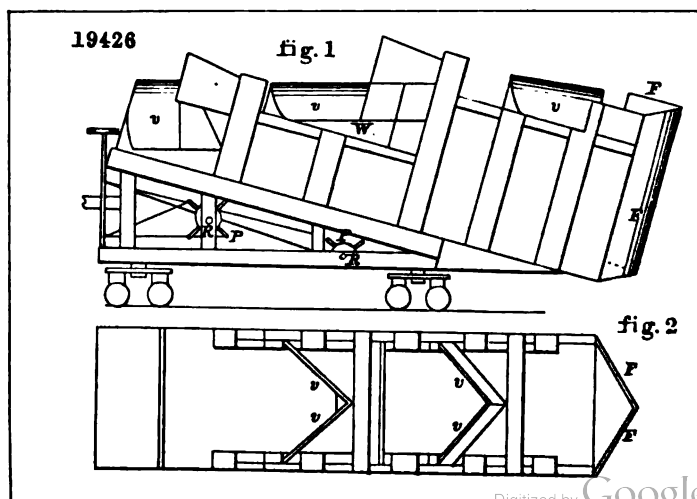
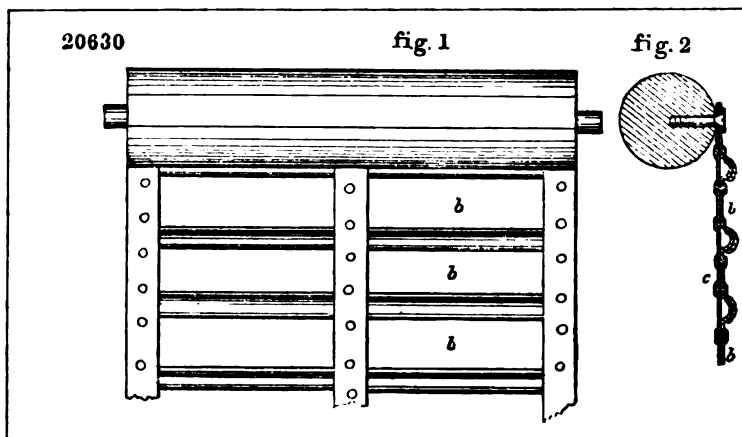
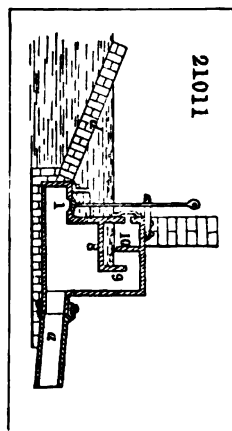
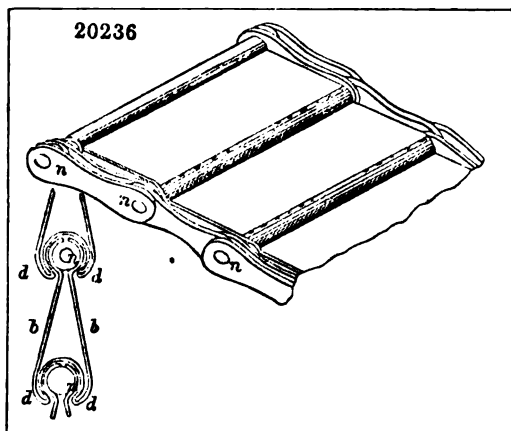


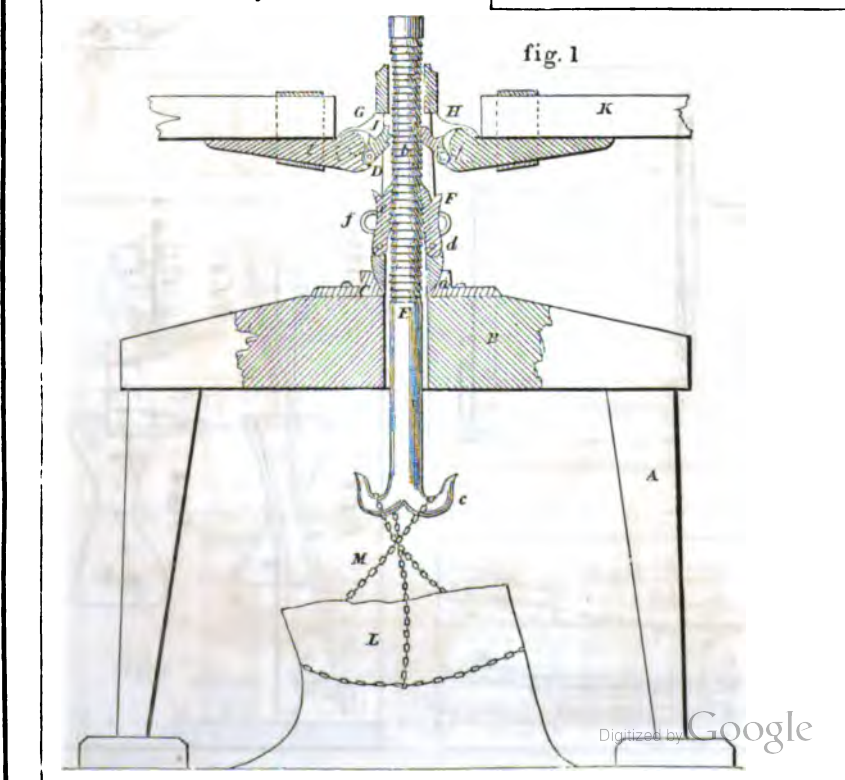
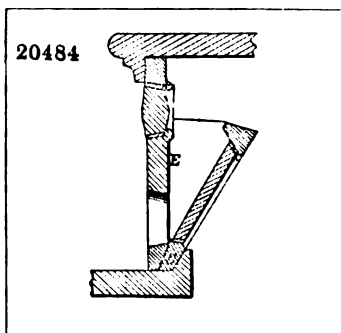
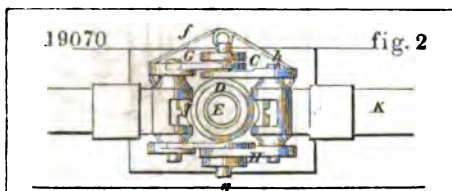
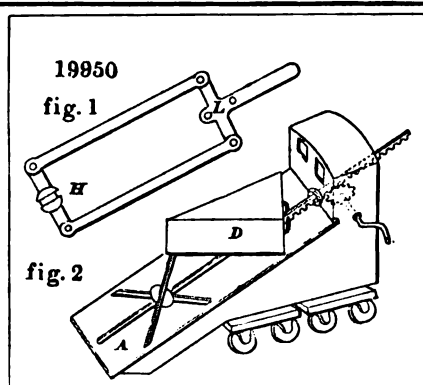
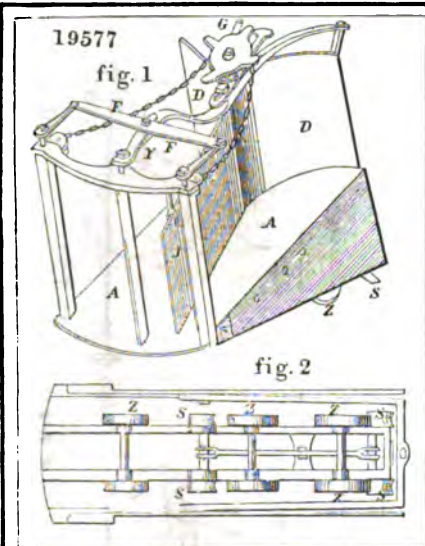
19314



19941







19562

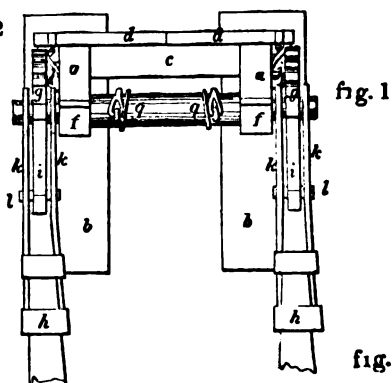
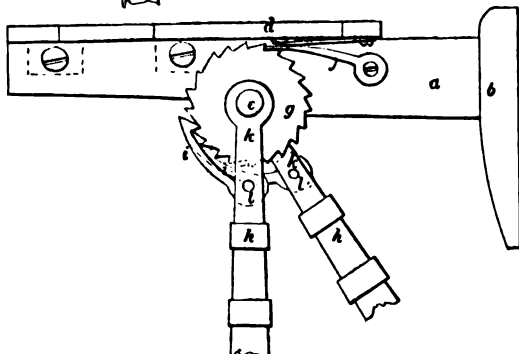


fig. 2



20494

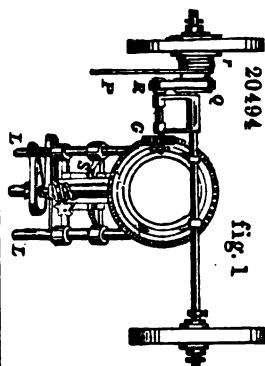
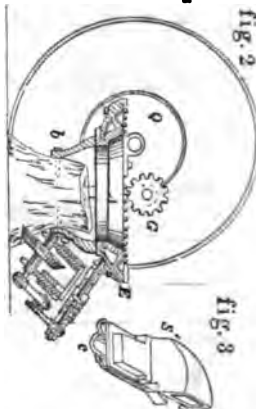
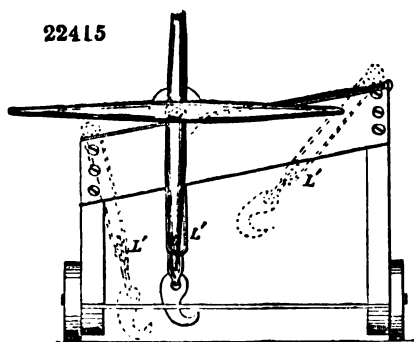


fig. 2



22415



19146

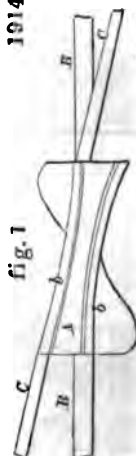
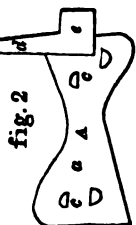
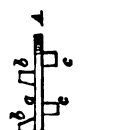


fig. 3



20367

fig. 1

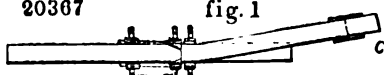


fig. 2



19397

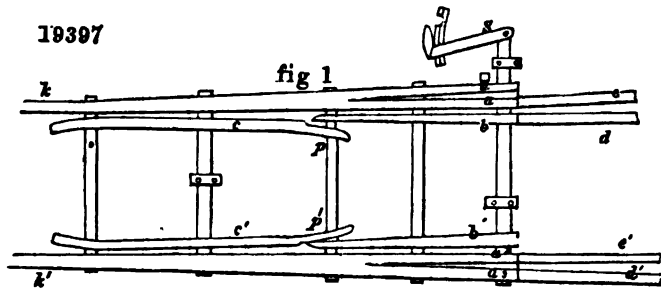
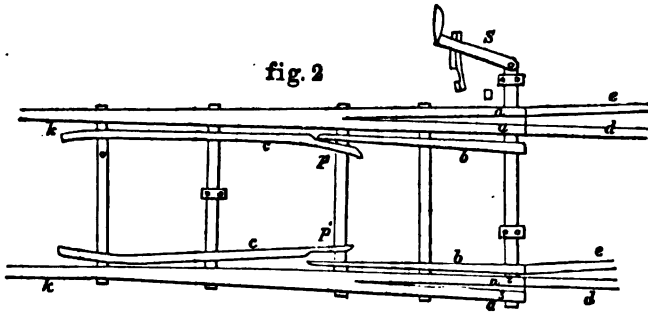
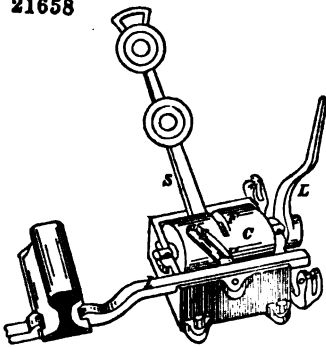


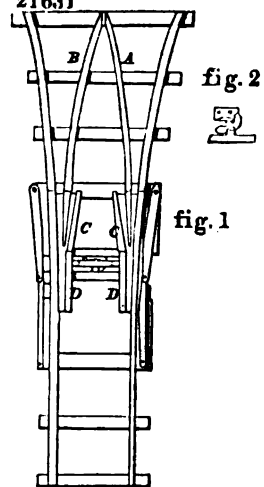
fig. 2



21658



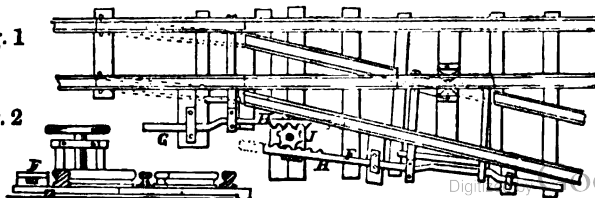
21631



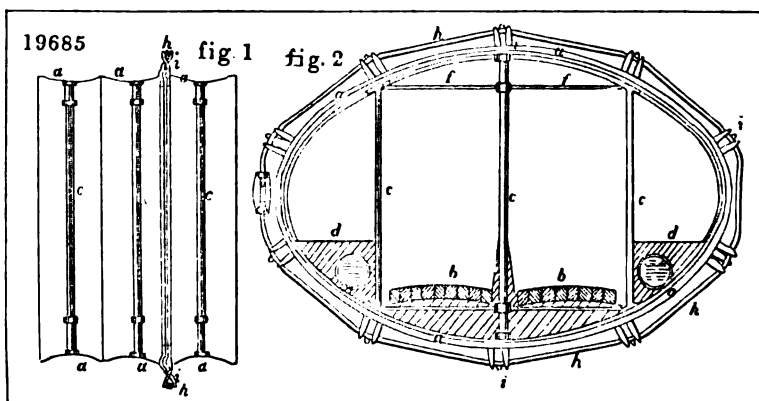
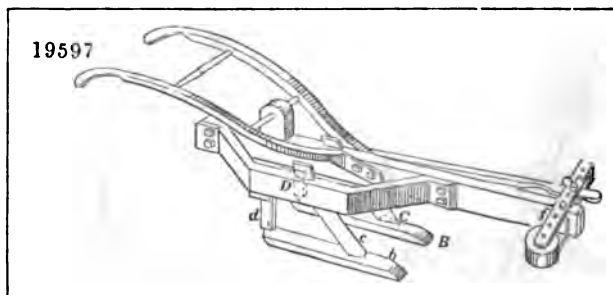
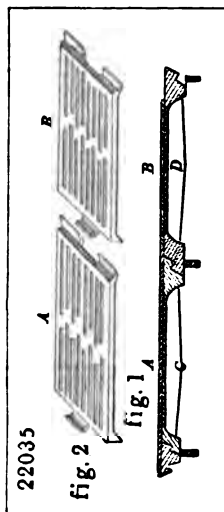
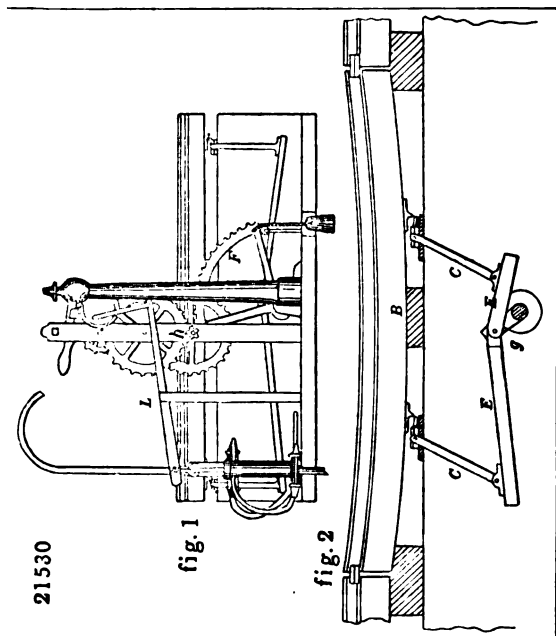
21880

fig. 1

fig. 2







19639

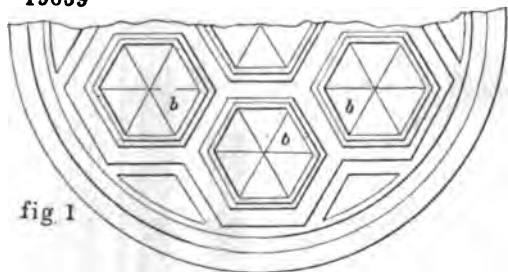


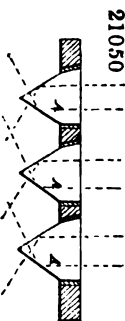
fig 1

fig. 2



fig. 2

fig. 1



21050

22069

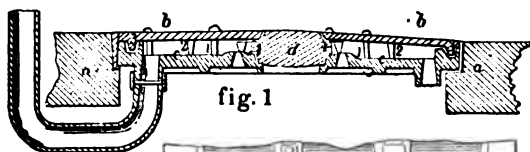


fig. 1

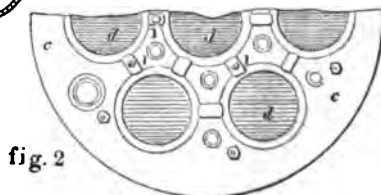
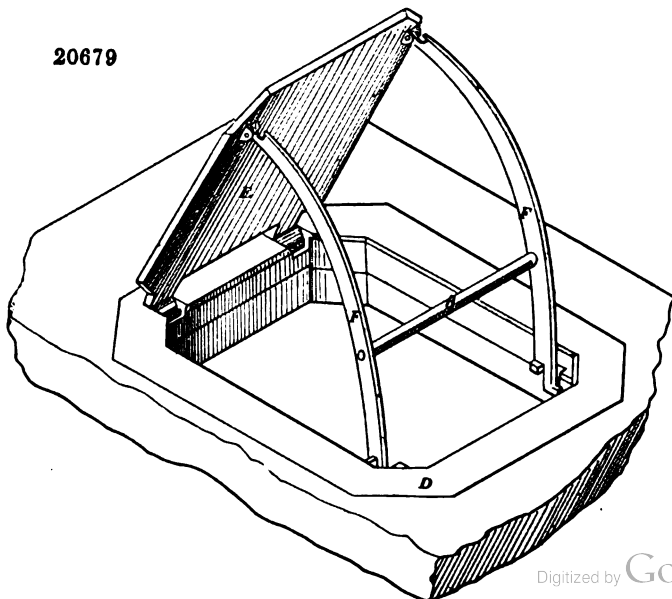
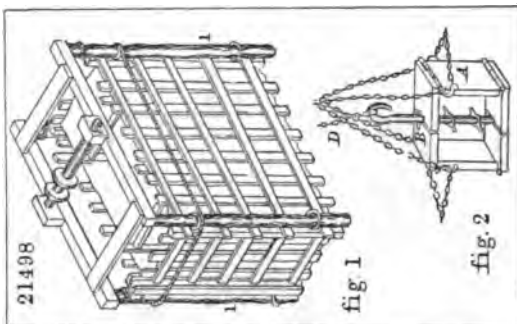


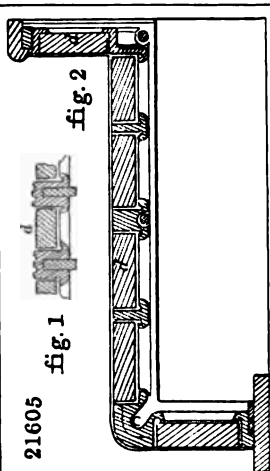
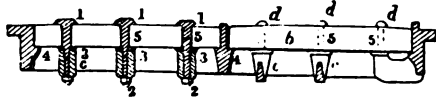
fig. 2

20679

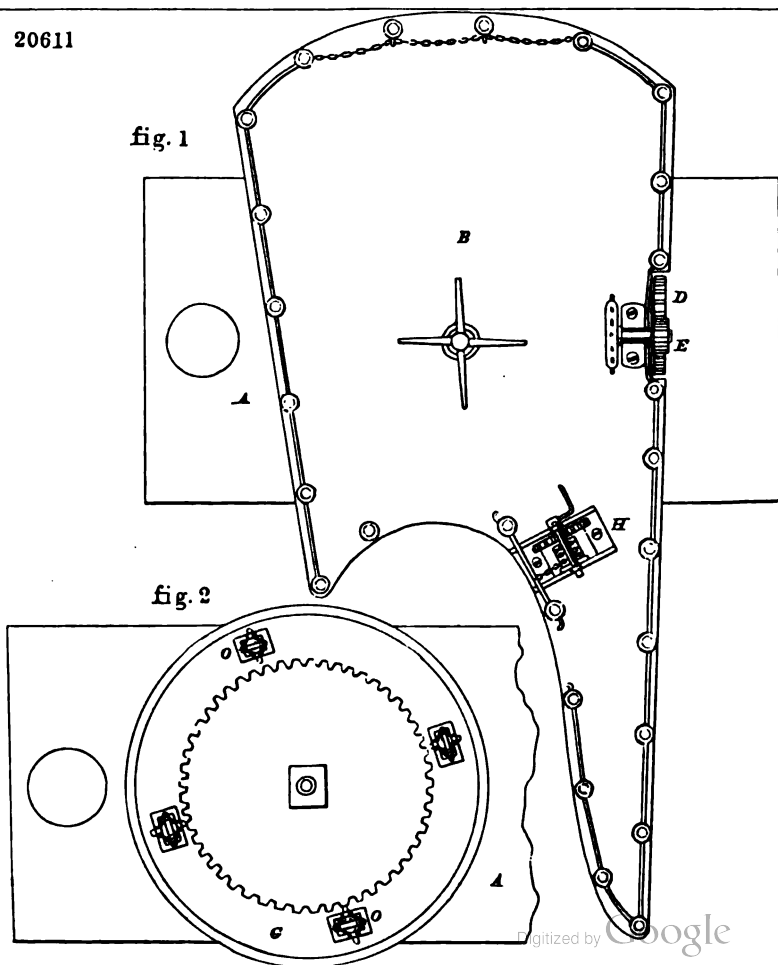


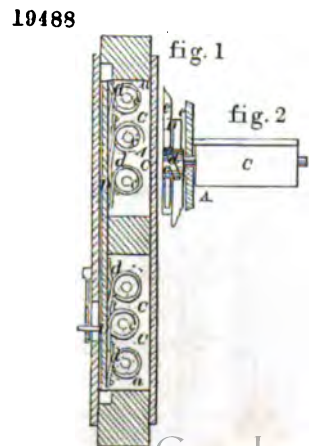
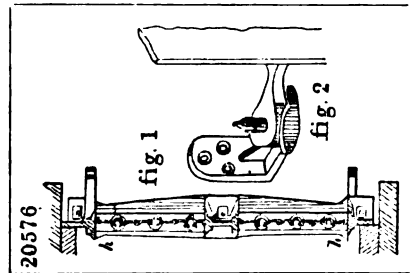
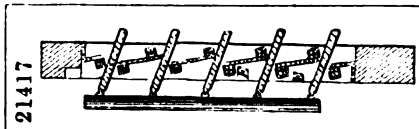
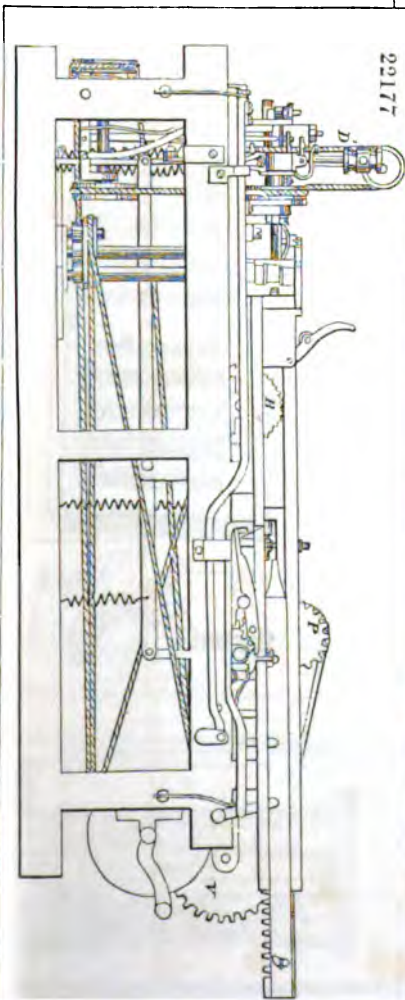
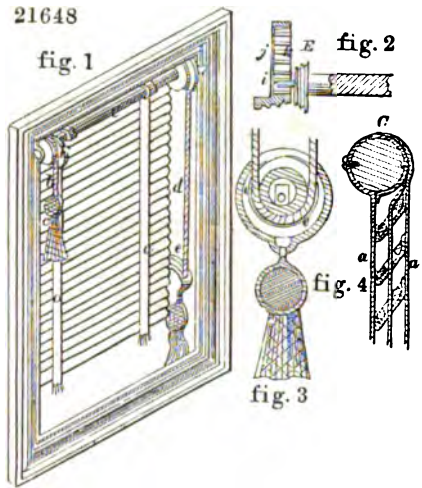
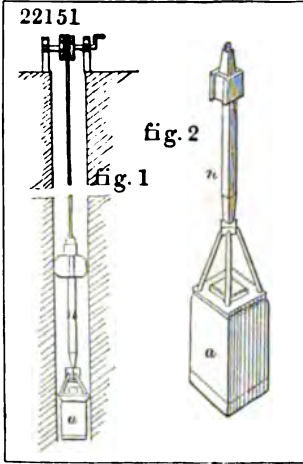


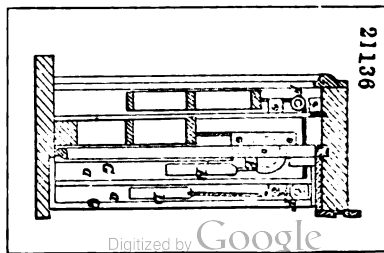
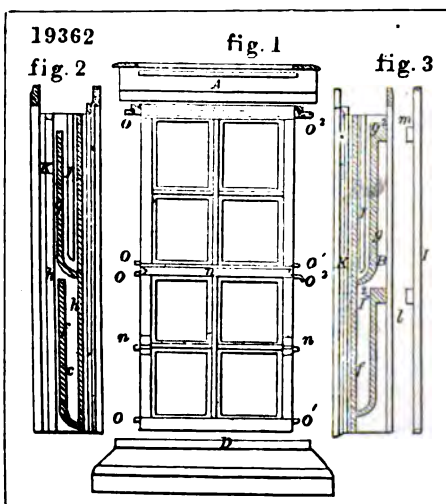
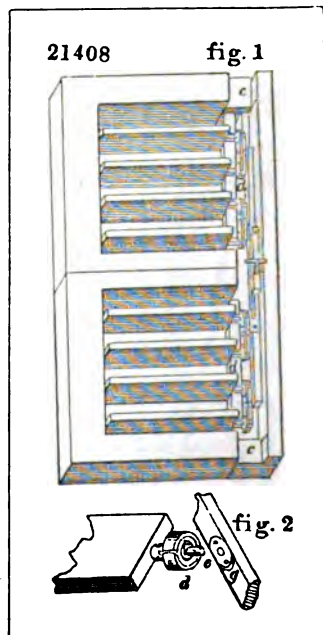
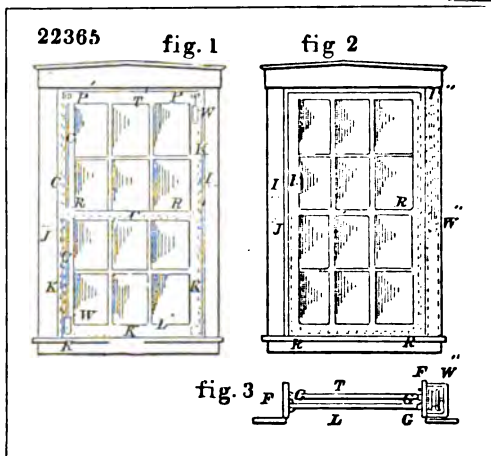
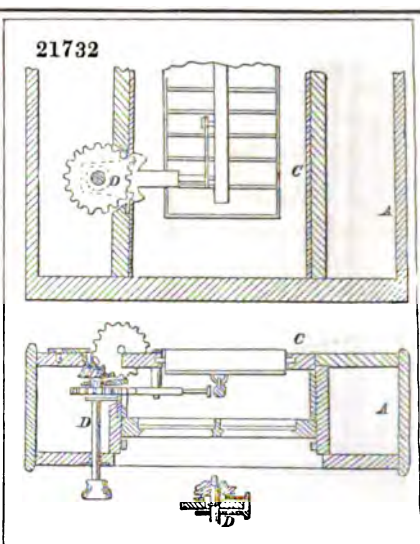
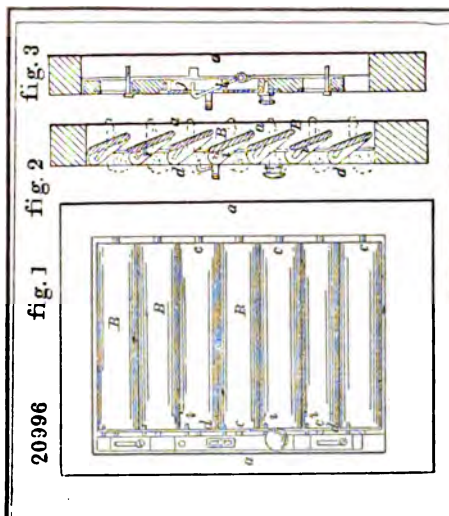
20721



20611







19301

fig. 1

fig. 2

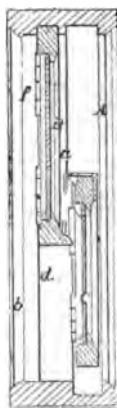
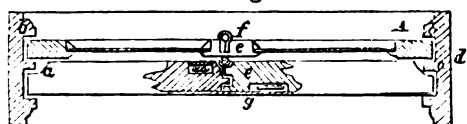
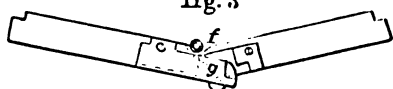


fig. 3



21916

fig. 1

fig. 2

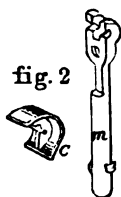
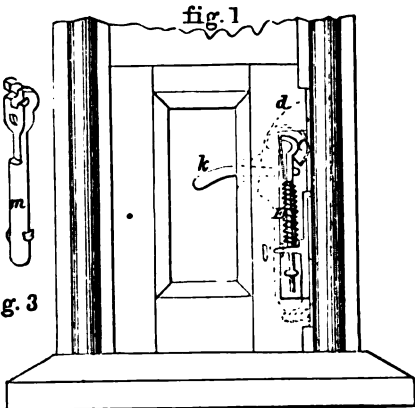


fig. 3



19267

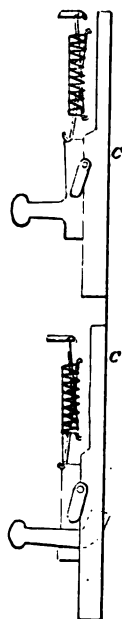
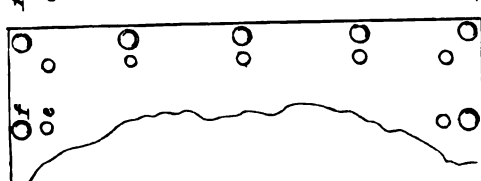
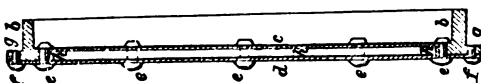
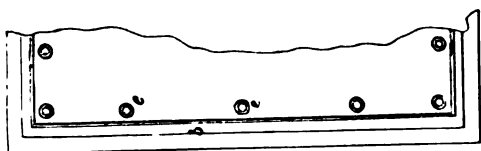


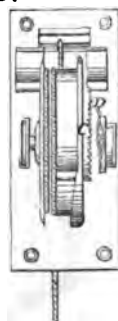
fig. 3

fig. 2

19348 fig. 1



20857



20535

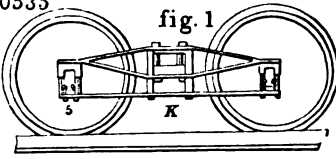


fig. 1

fig. 2

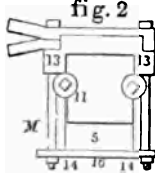


fig. 3

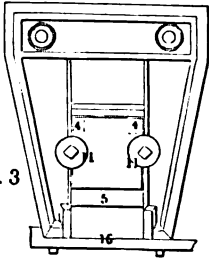


fig. 2

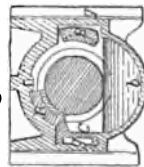
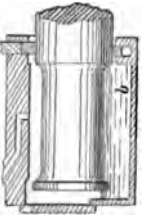


fig. 1



21943

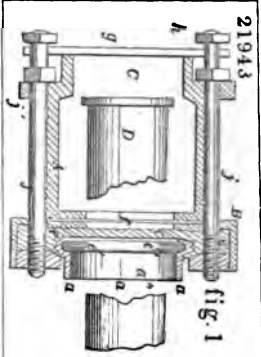
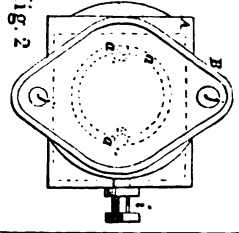


fig. 1

fig. 2



21652

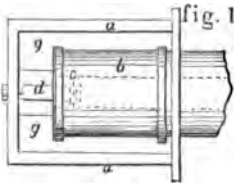
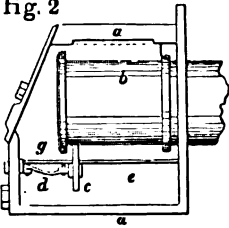


fig. 1

fig. 2



19762

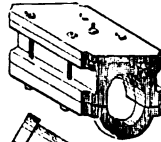


fig. 1

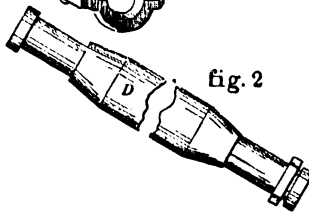


fig. 2

19290

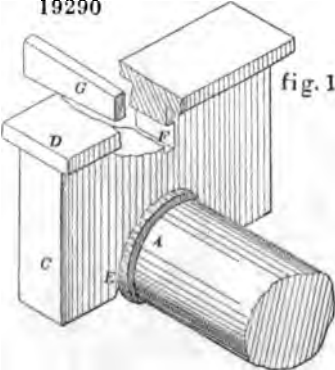


fig. 1

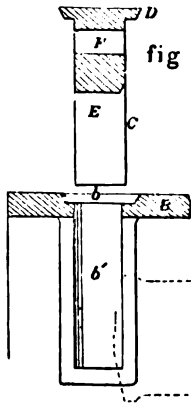


fig. 2

20991

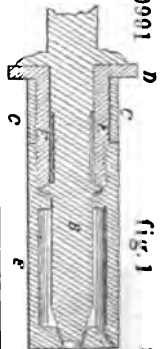
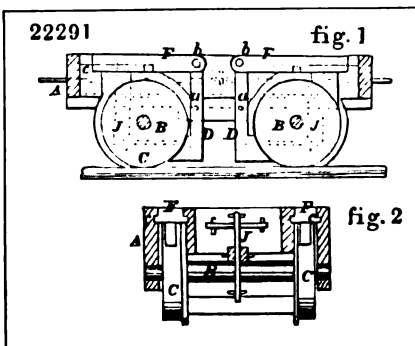
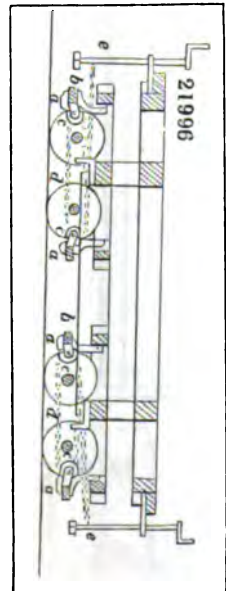
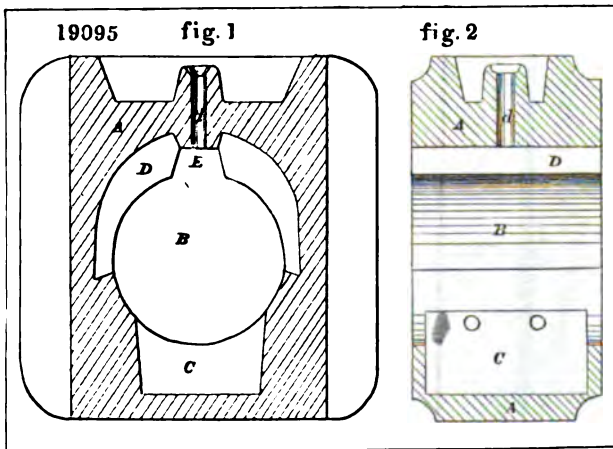
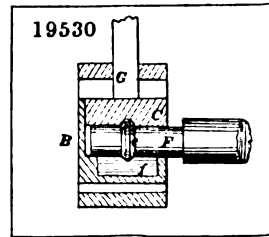
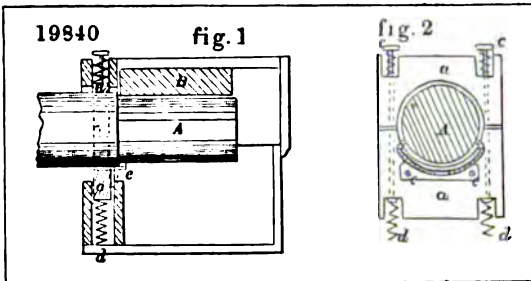
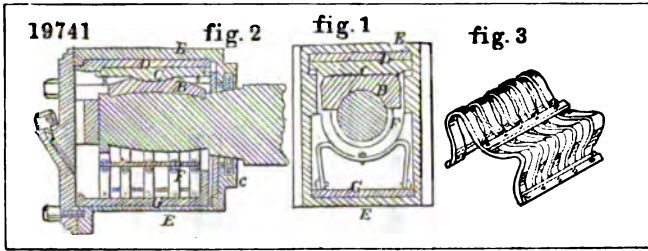


fig. 1

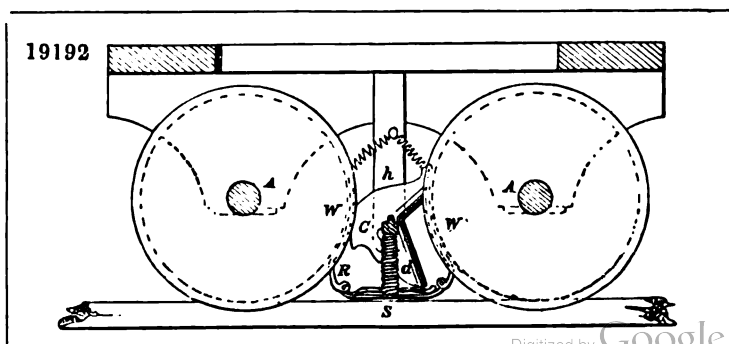
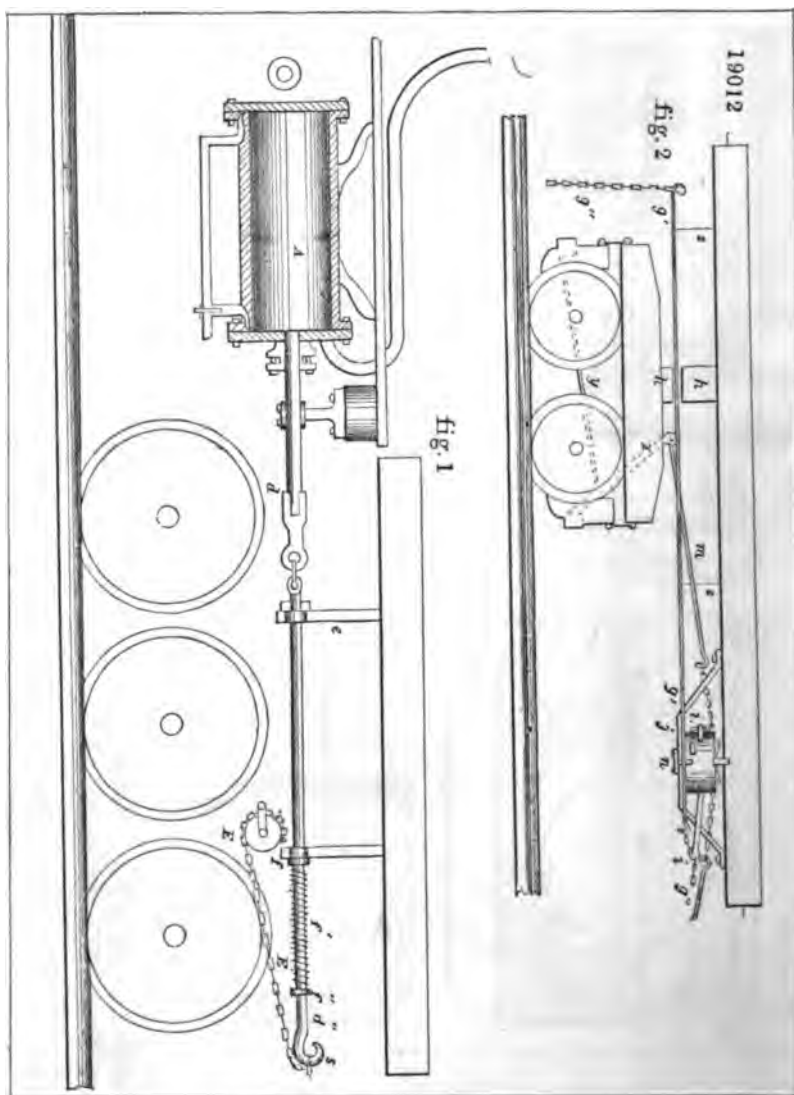
fig. 2



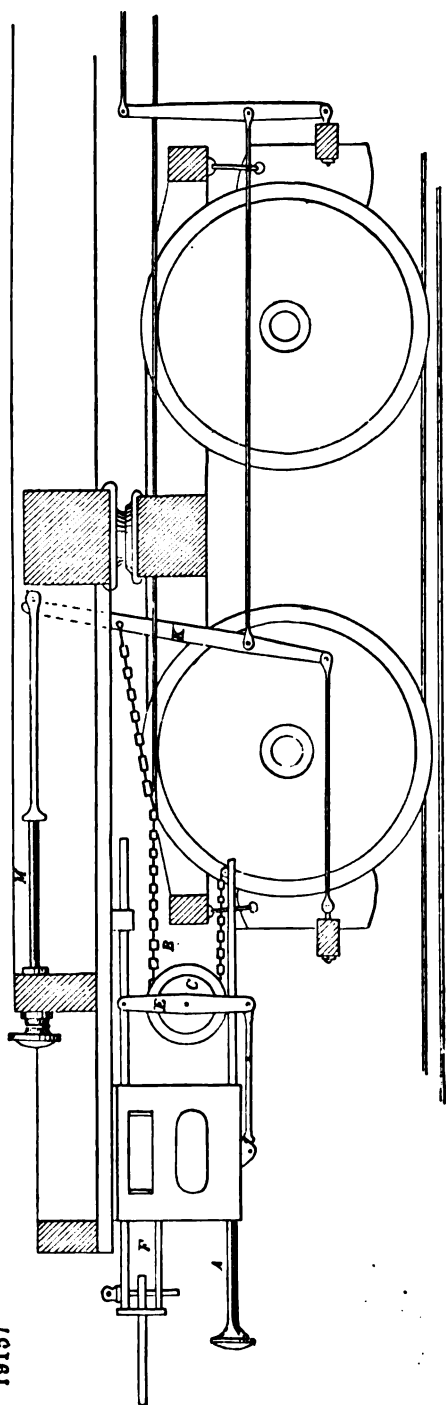




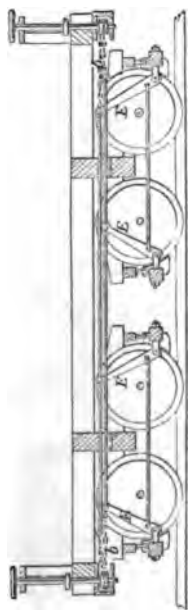




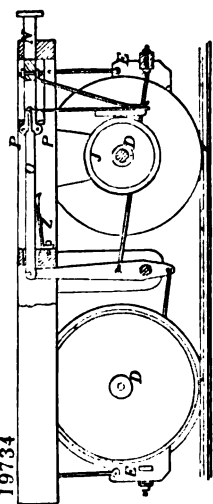
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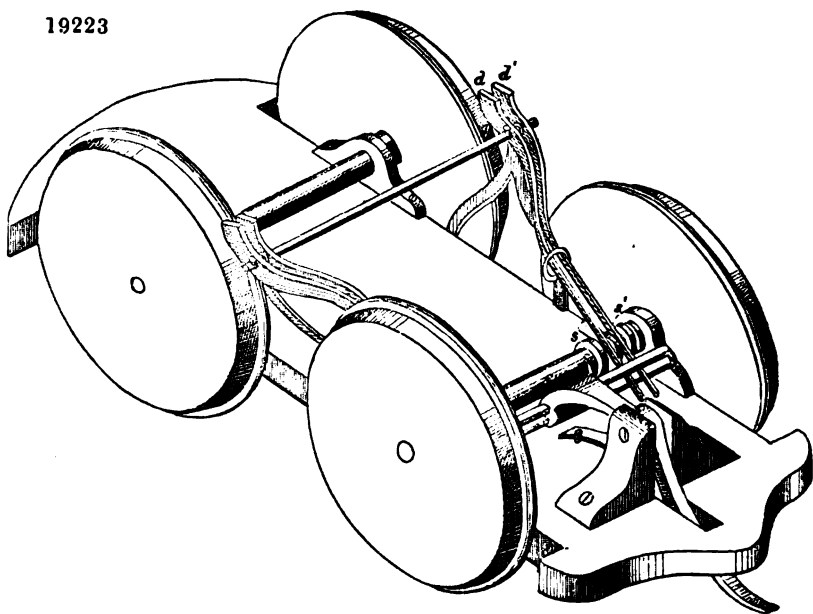
19017



19734



19223



19599

fig. 1

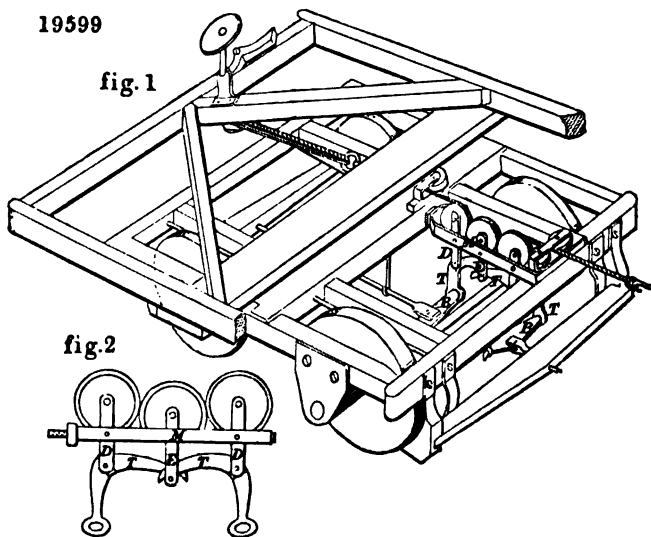
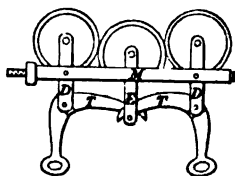
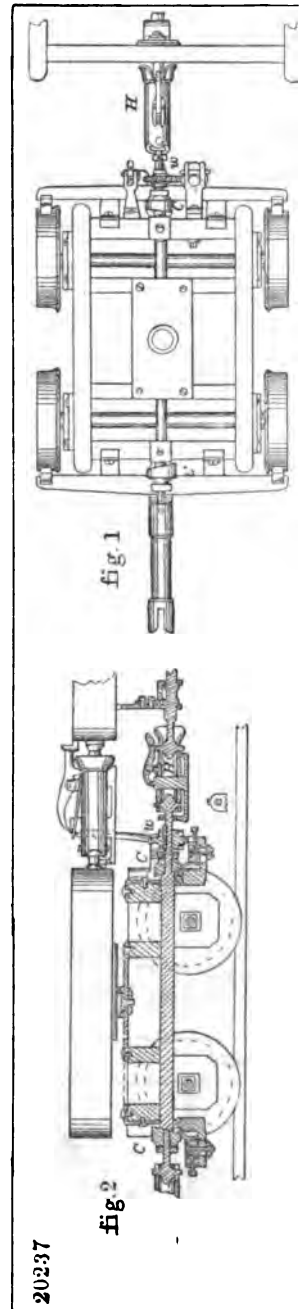
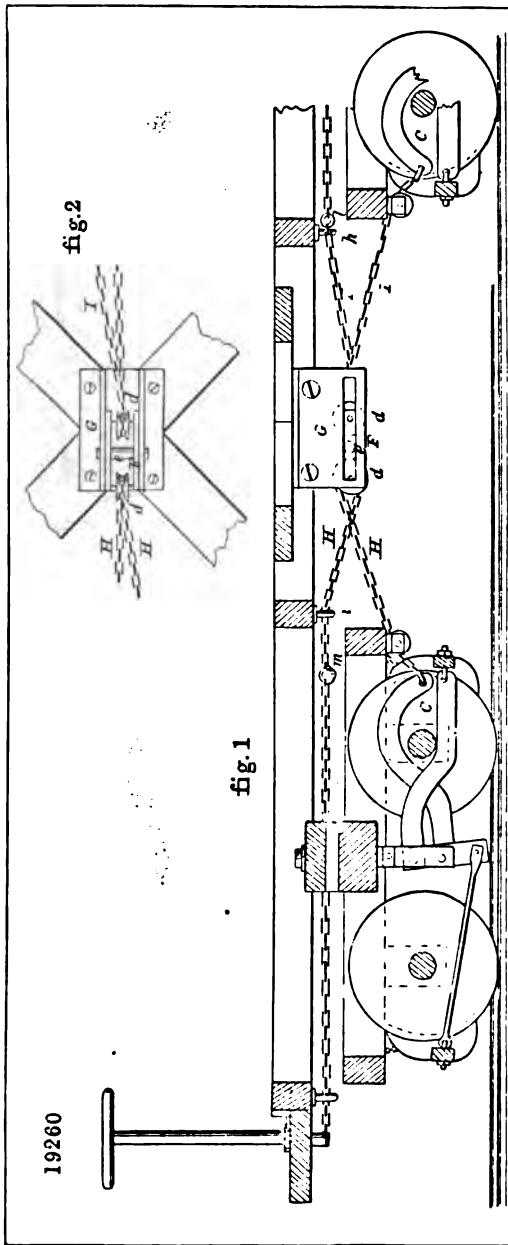
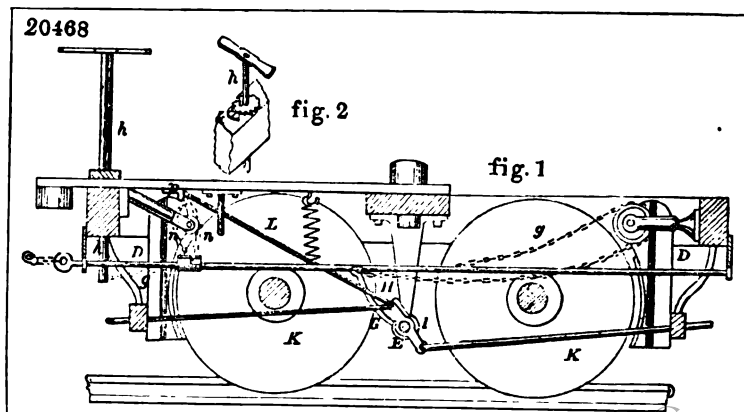
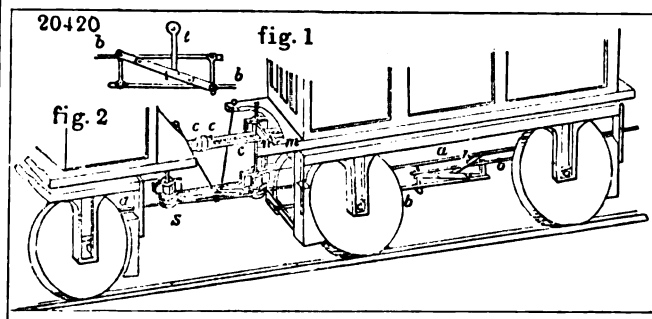
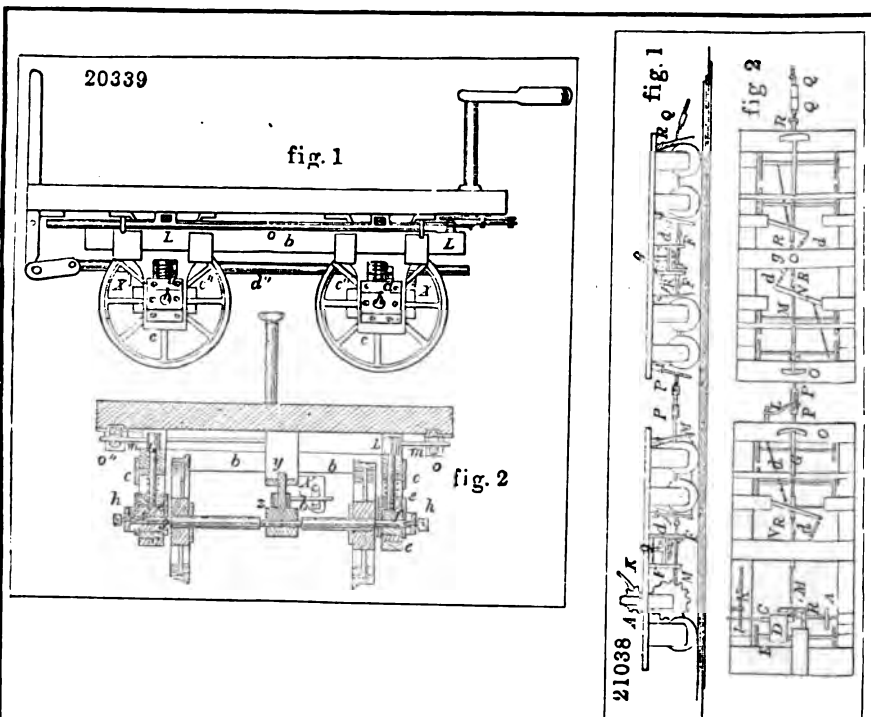
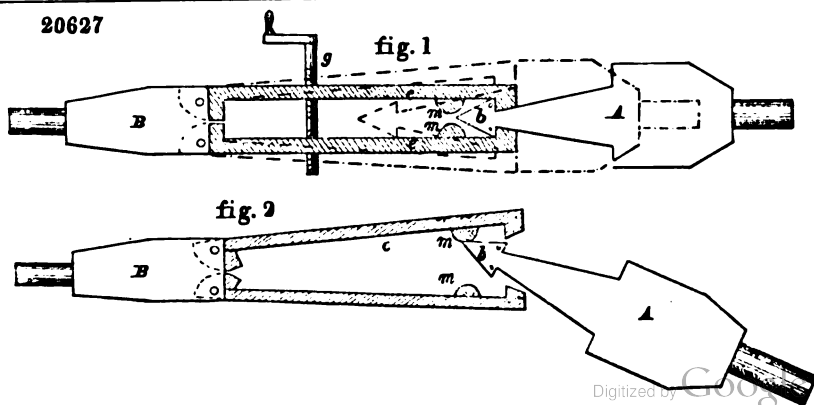
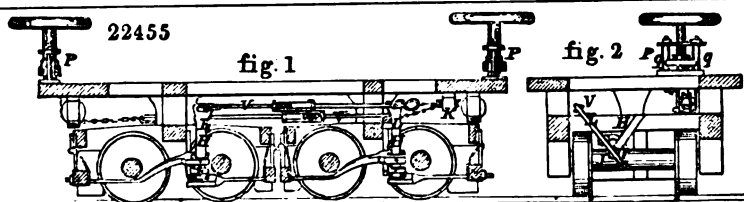
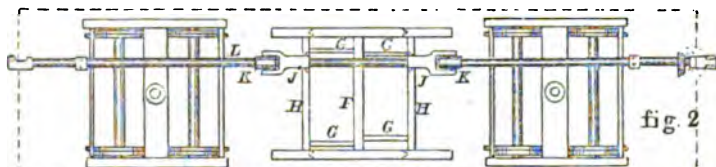
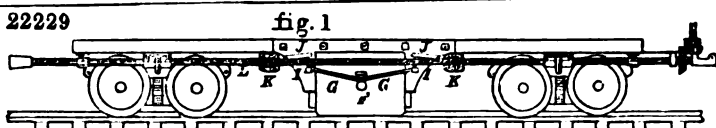
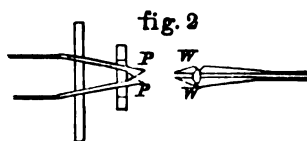
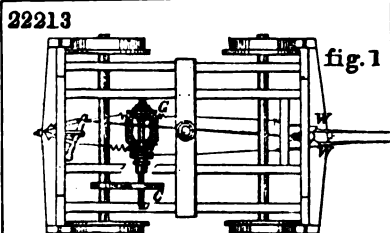
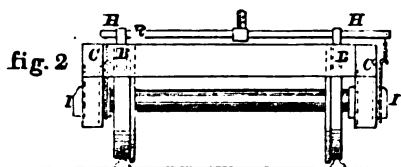
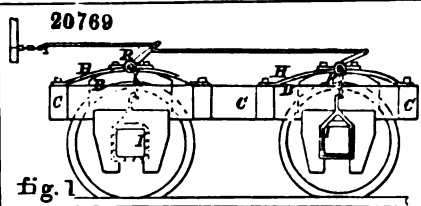


fig. 2

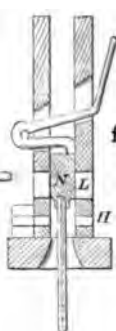
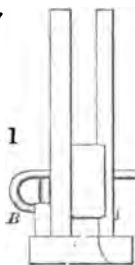




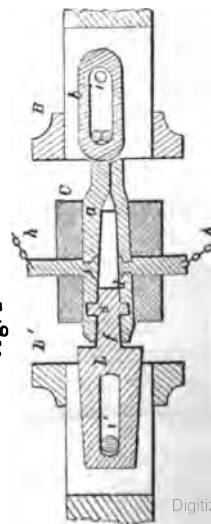
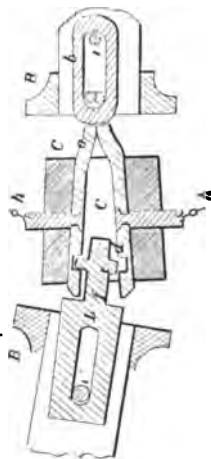
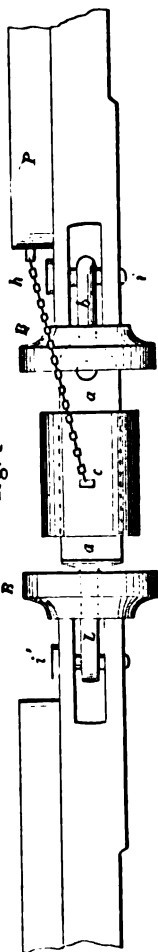


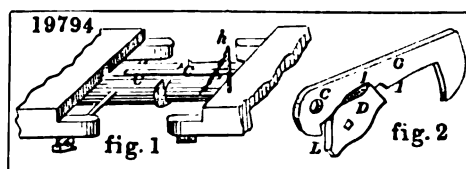
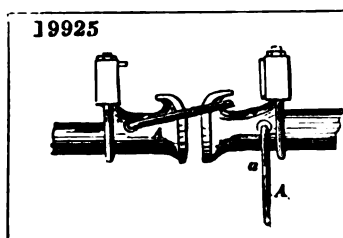
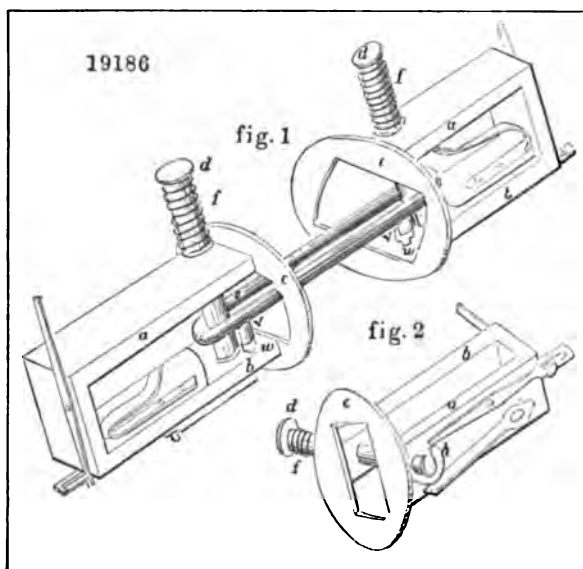
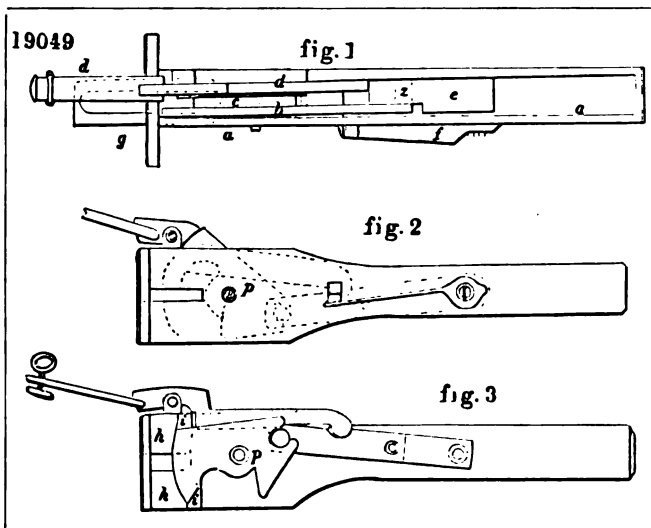


**21737**



19021







19204

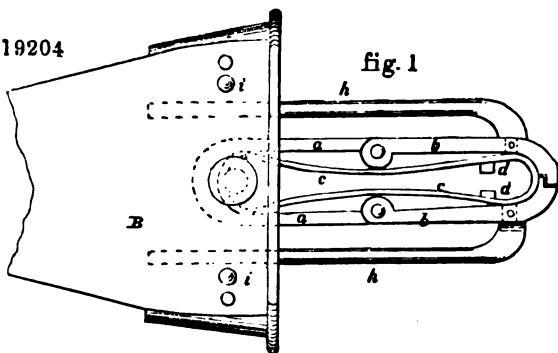


fig. 1

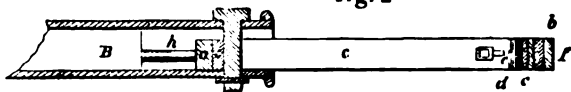
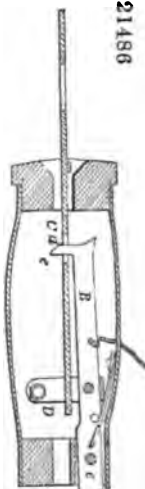


fig. 2

21486



20264

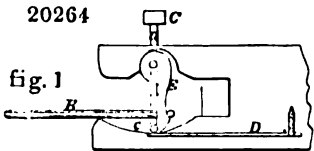


fig. 1

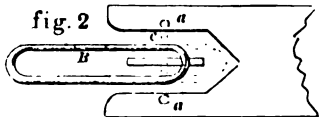
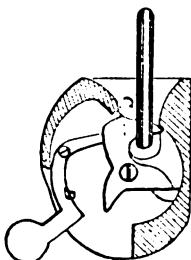
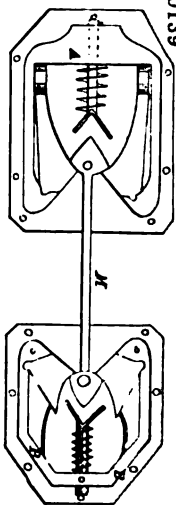


fig. 2

20392



20139



21502

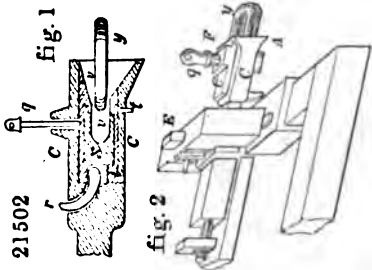


fig. 1

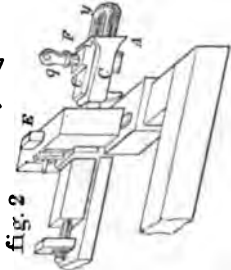


fig. 2

20817

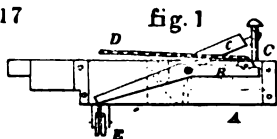


fig. 1

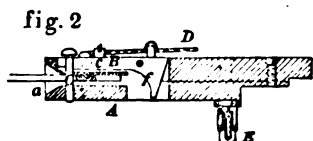
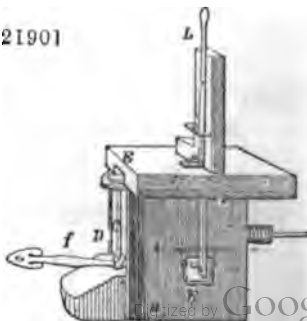
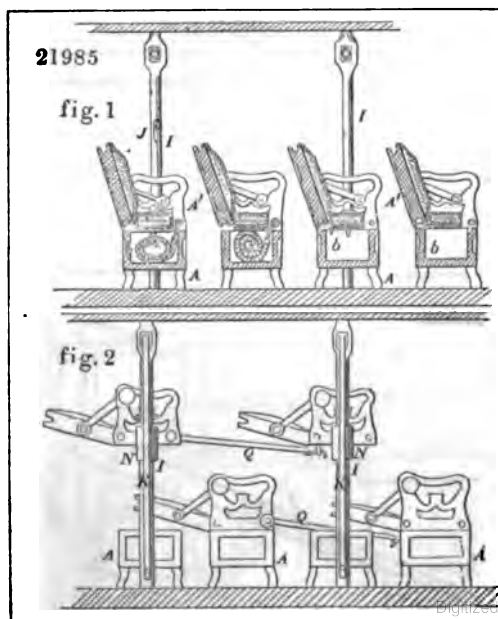
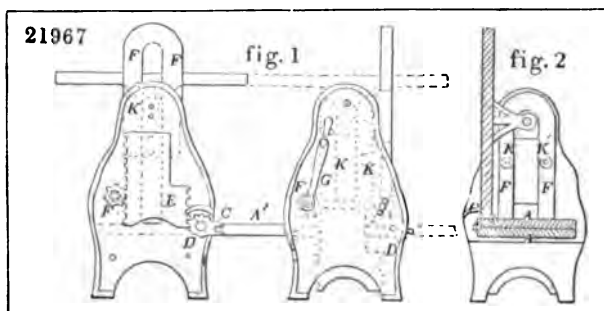
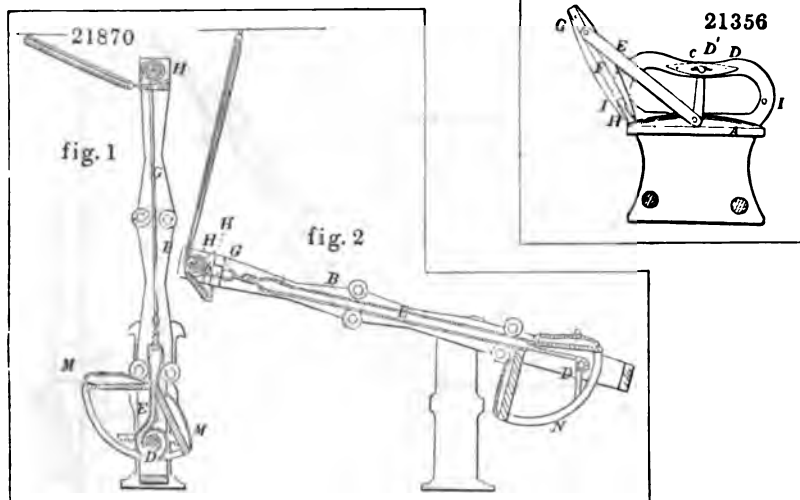


fig. 2

21901





19079

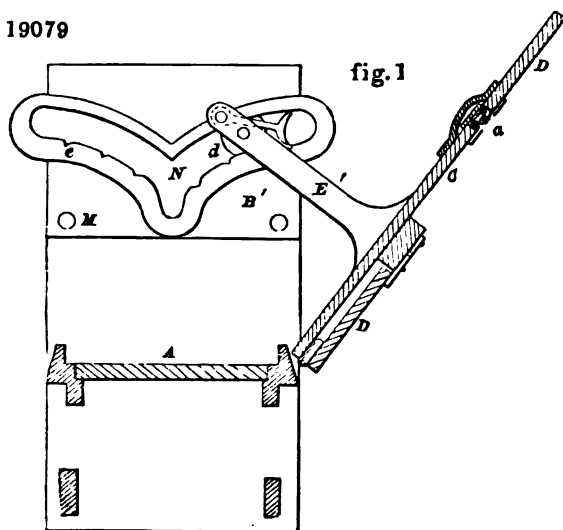
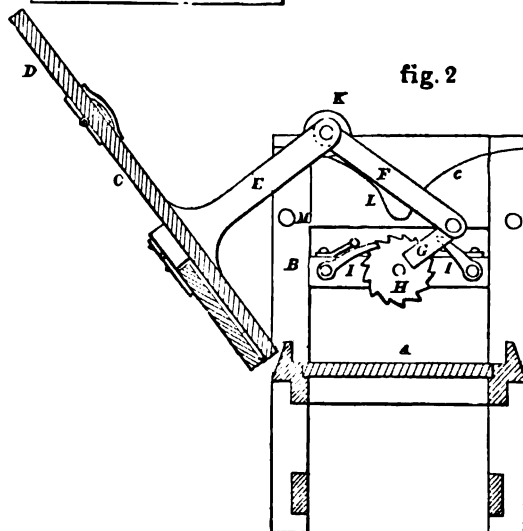
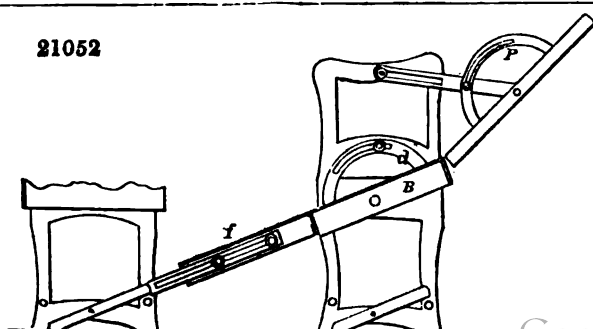


fig. 2



21052



20654

fig. 1

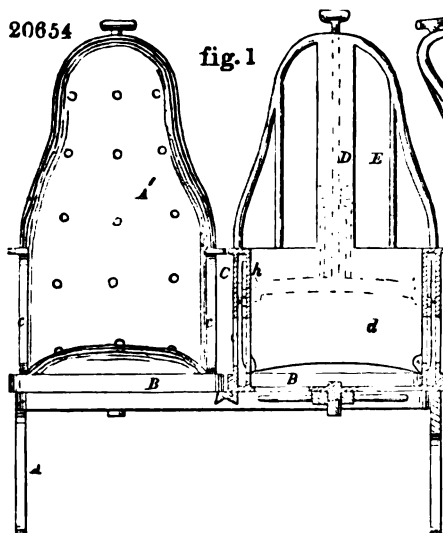
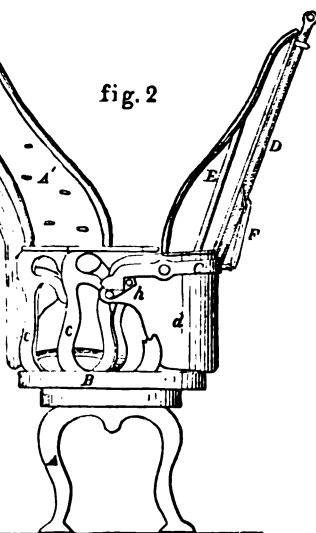
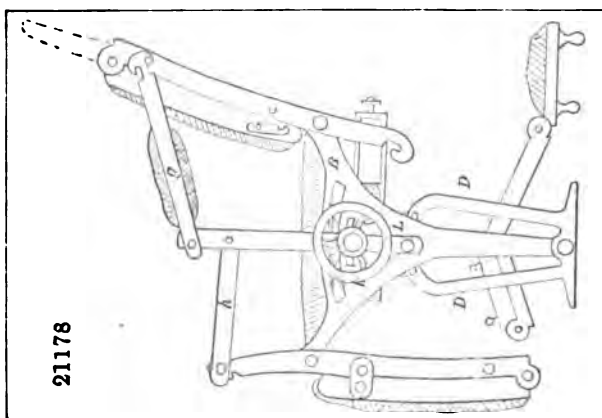


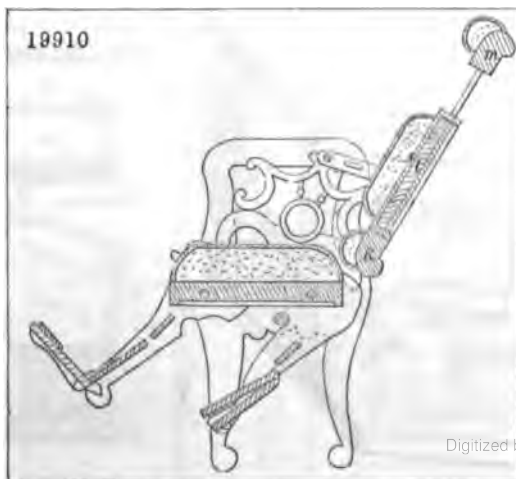
fig. 2

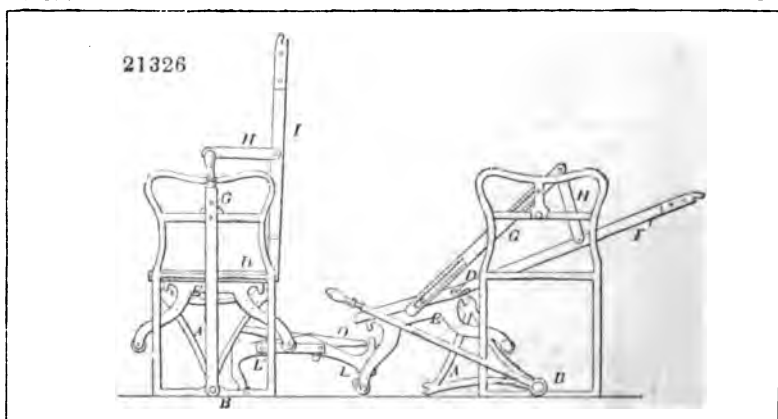
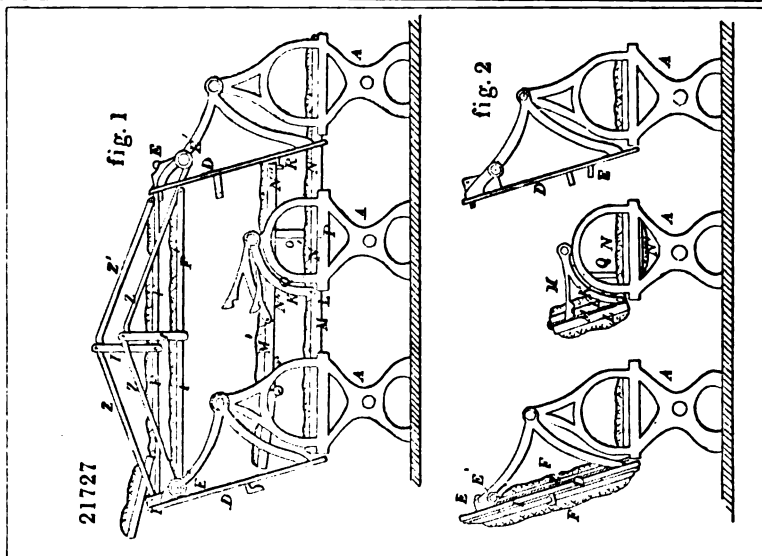


21178

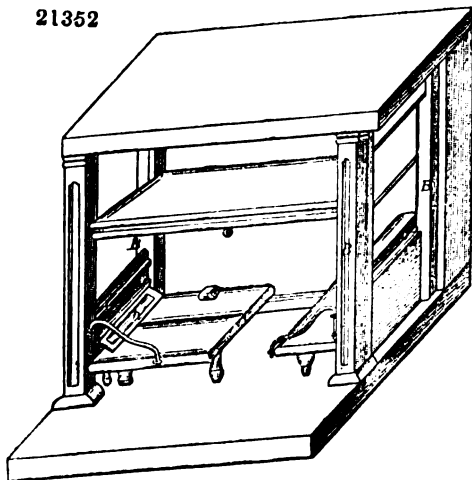


18910

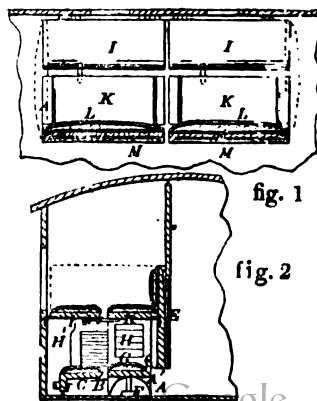




21352



22471



20622

fig. 1

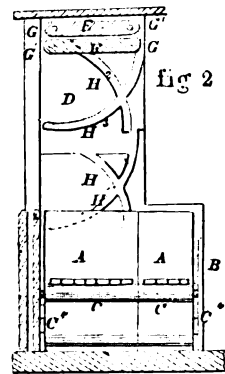
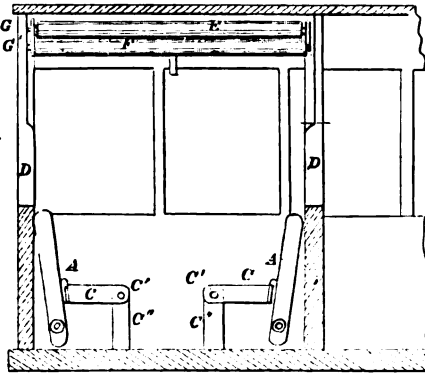
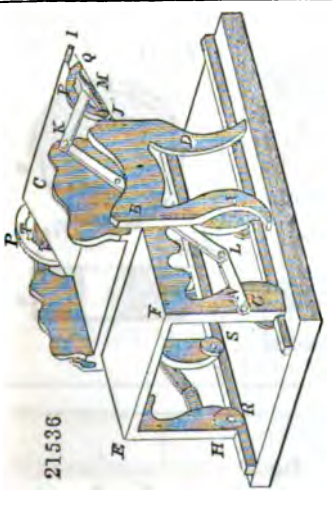
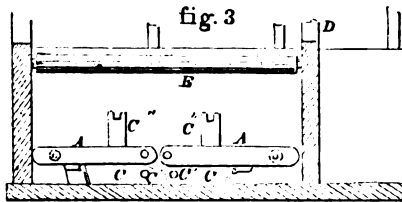
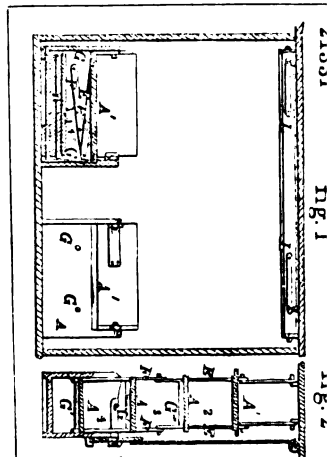
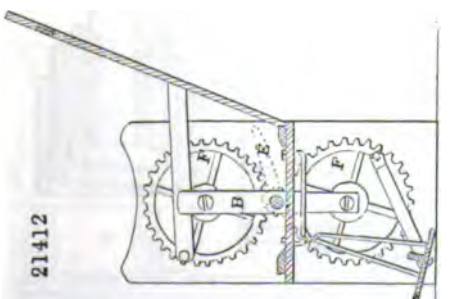
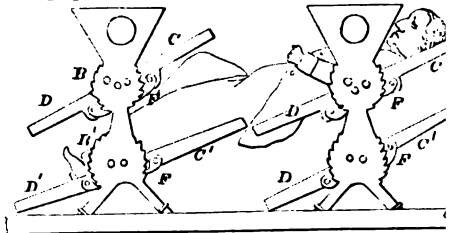


fig. 3



21251



22462

fig. 1

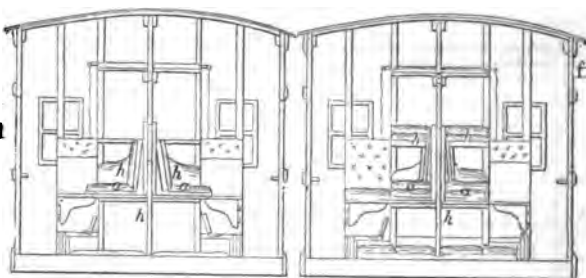


fig. 2

22388

fig. 1

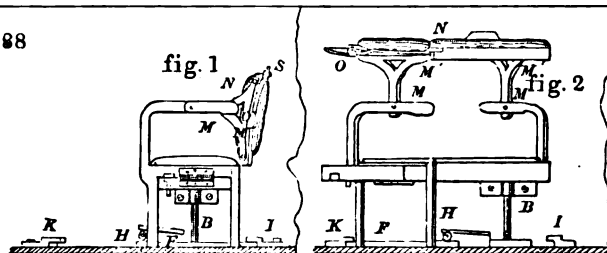


fig. 2

22283

fig. 1

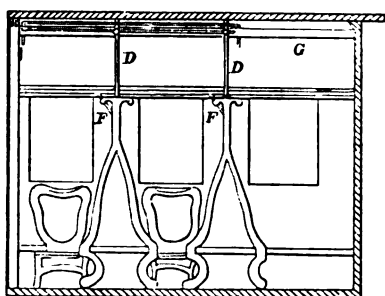
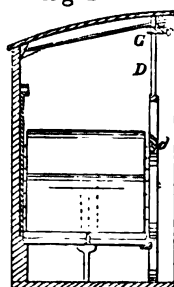


fig. 2



21624



fig. 2

fig. 1



22292

fig. 1

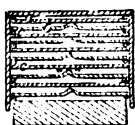


fig. 2

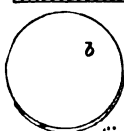
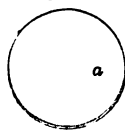


fig. 3

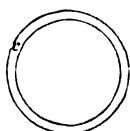


fig. 4

21952

fig. 1

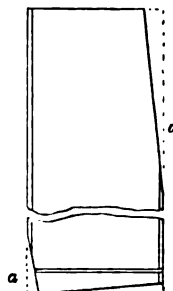
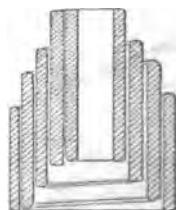
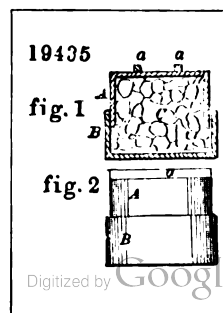
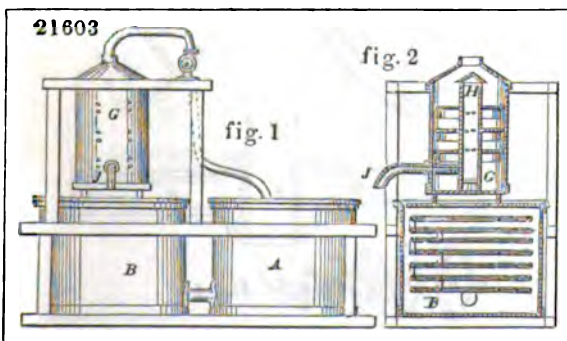
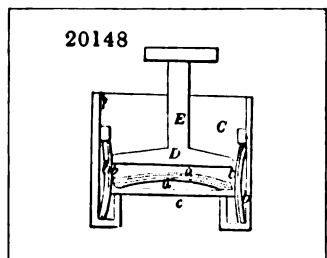
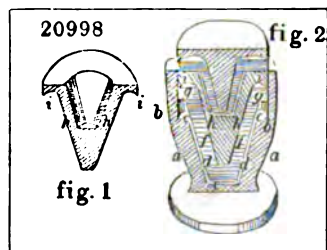
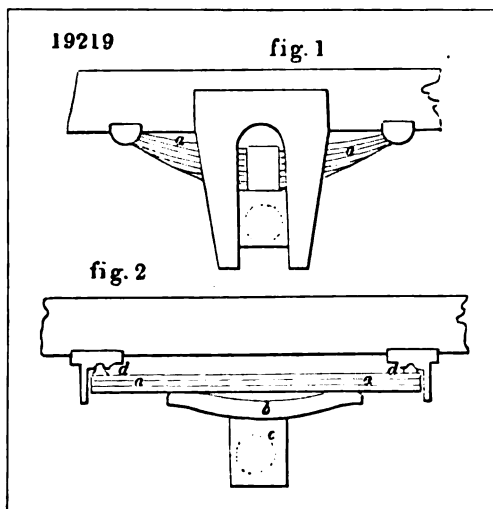
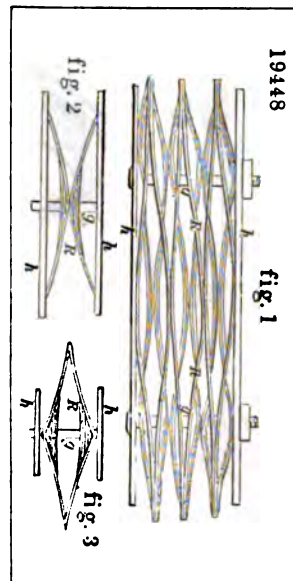
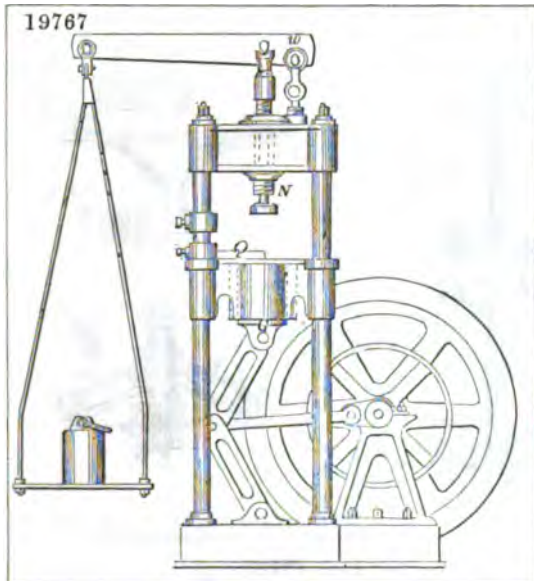
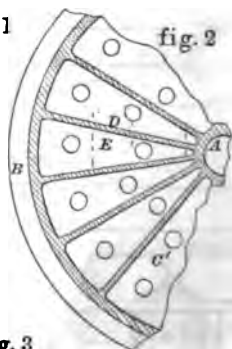
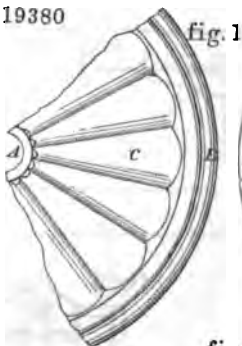
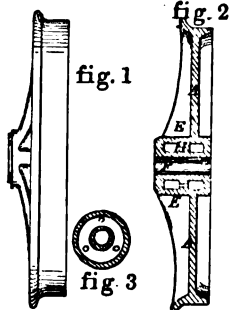
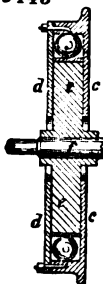
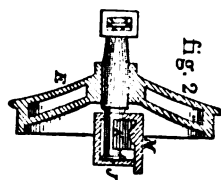
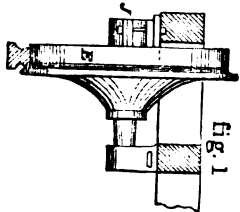
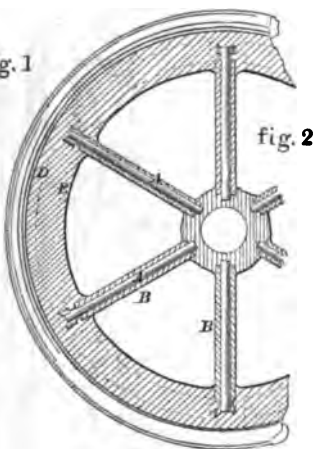
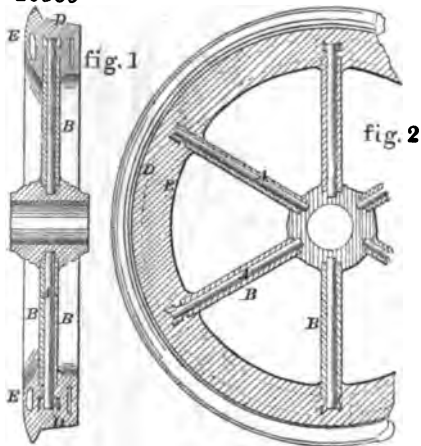


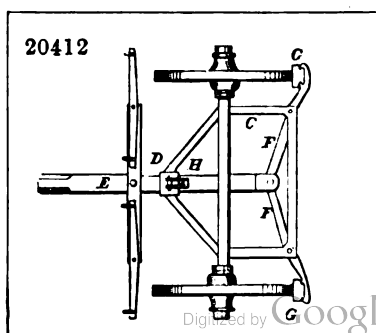
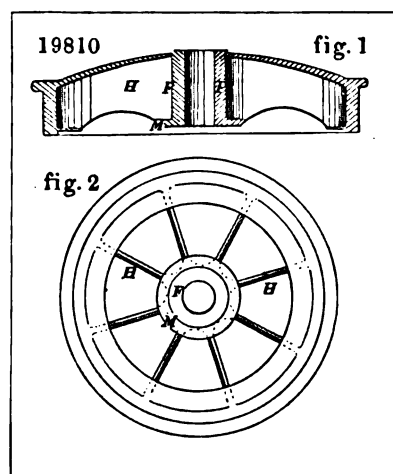
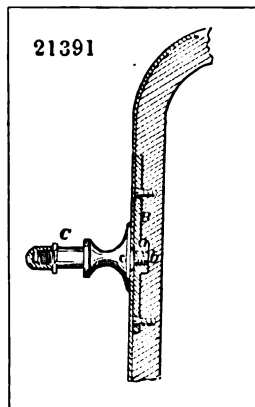
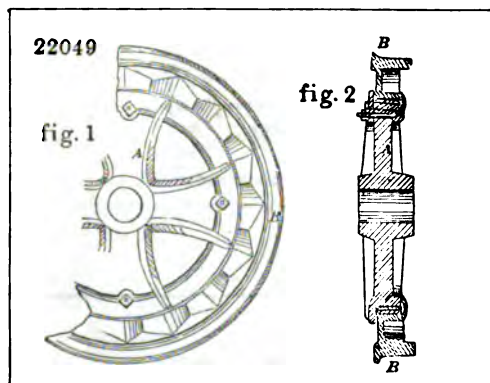
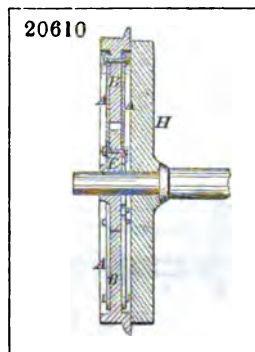
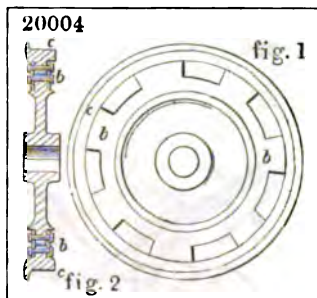
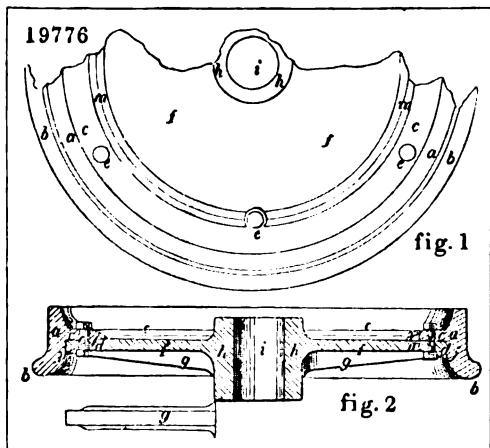
fig. 2



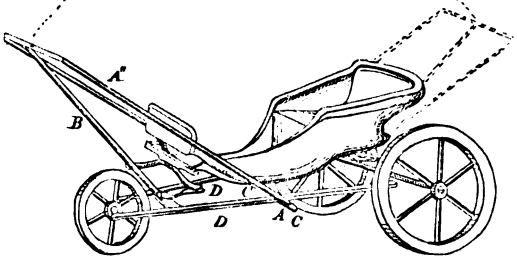




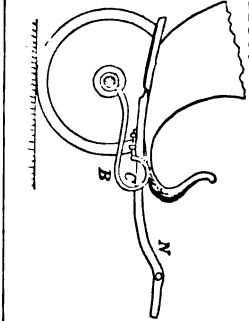




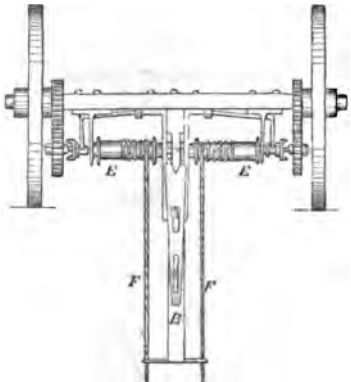
21353



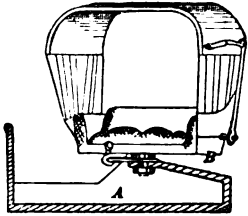
22300



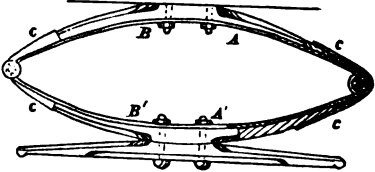
21449



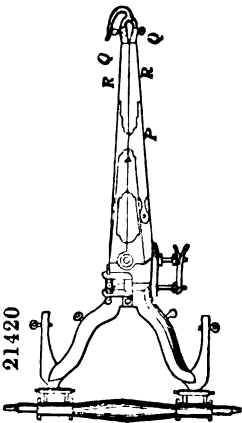
22304



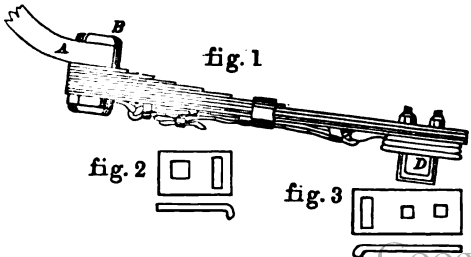
20497

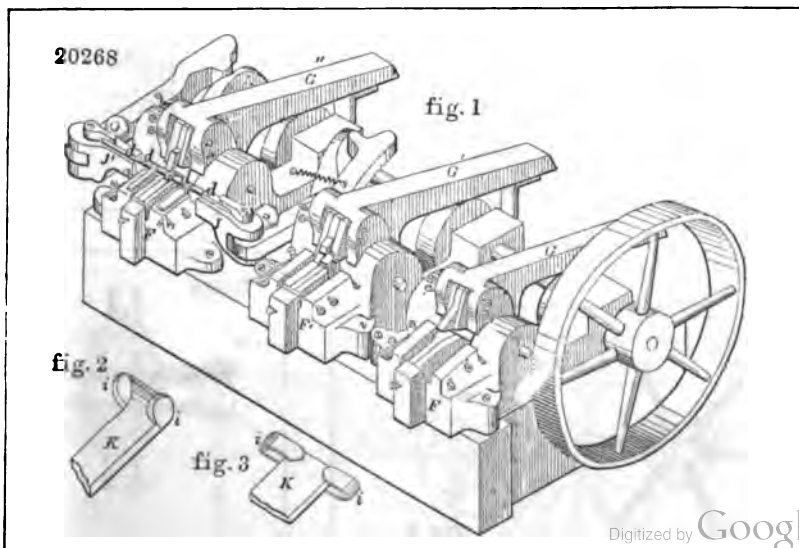
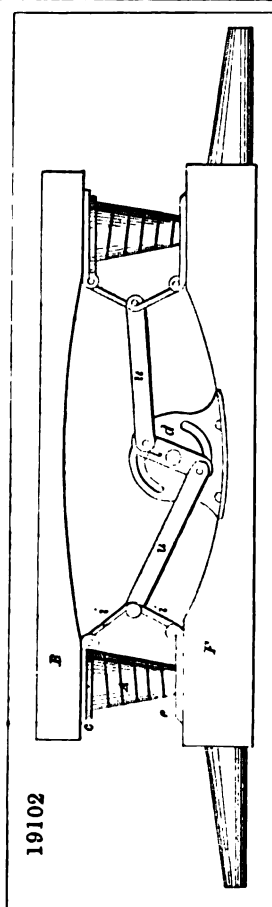
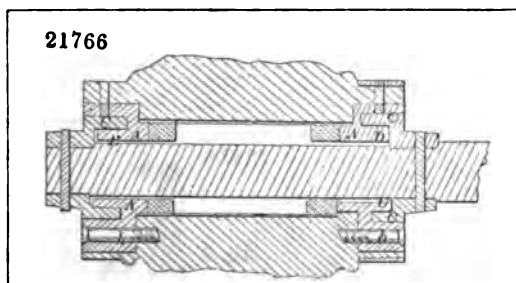
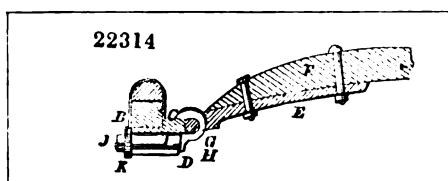
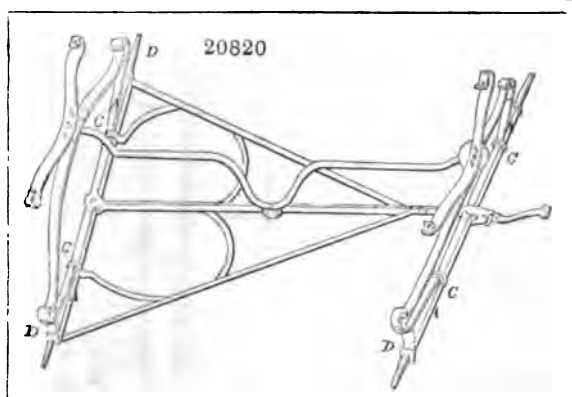


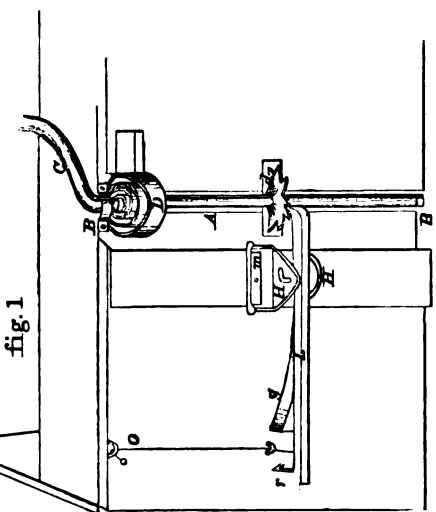
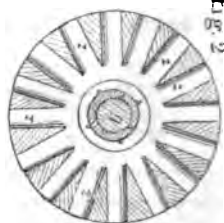
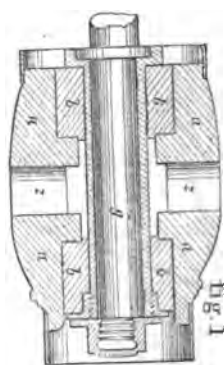
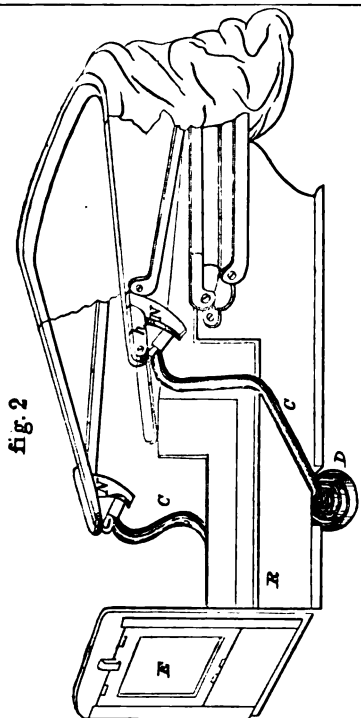
21420



19396







19478

fig. 1

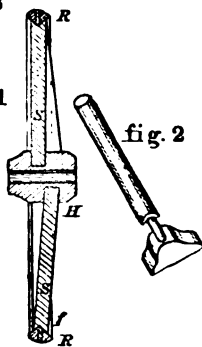
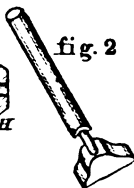
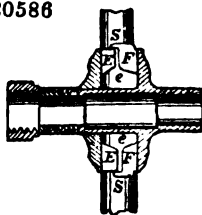


fig. 2



20586



21683

fig. 1

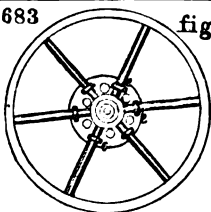
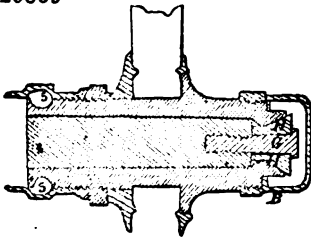


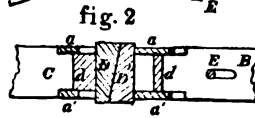
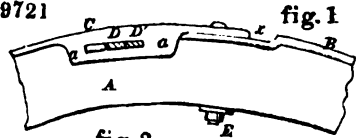
fig. 2



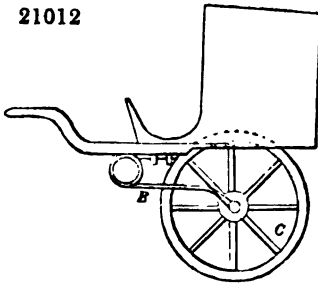
20869



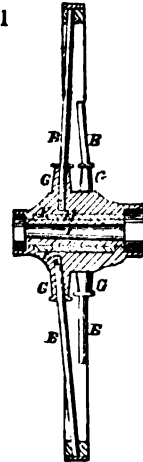
19721



21012



19951



19113

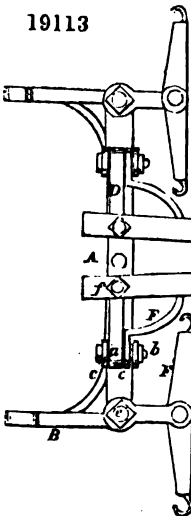


fig. 1

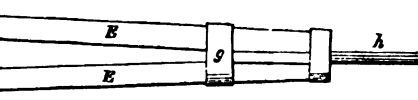


fig. 2

19264

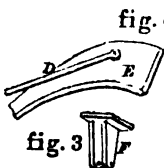


fig. 3

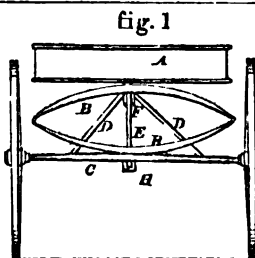


fig. 1

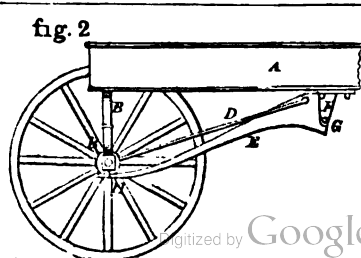
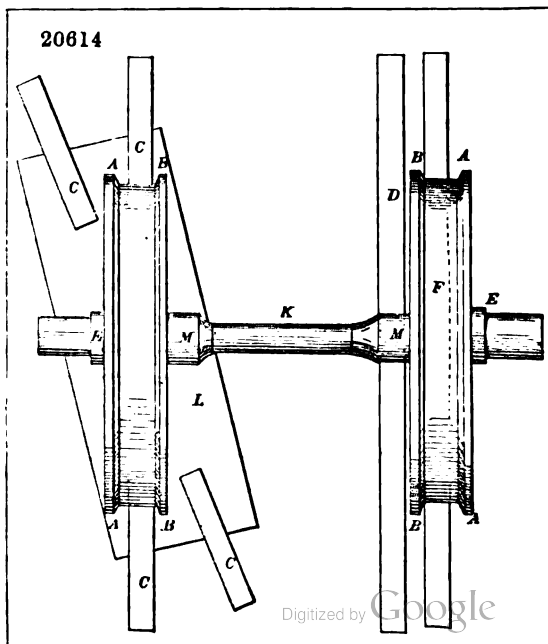
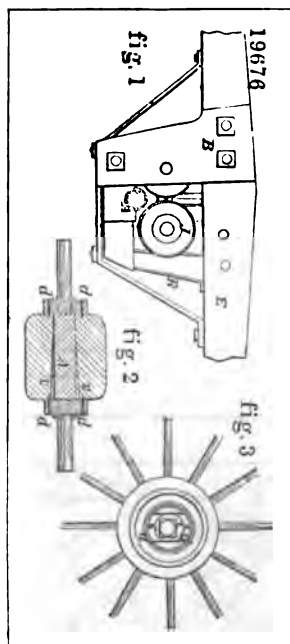
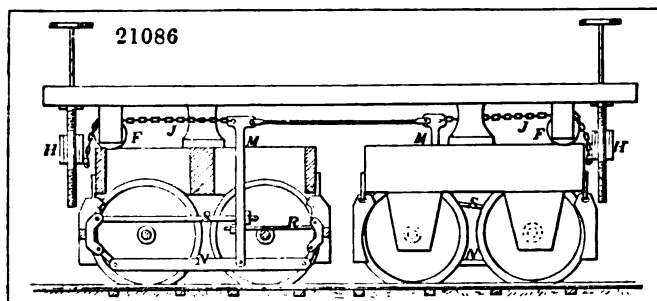
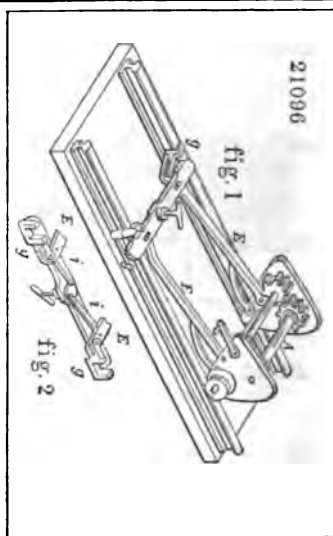
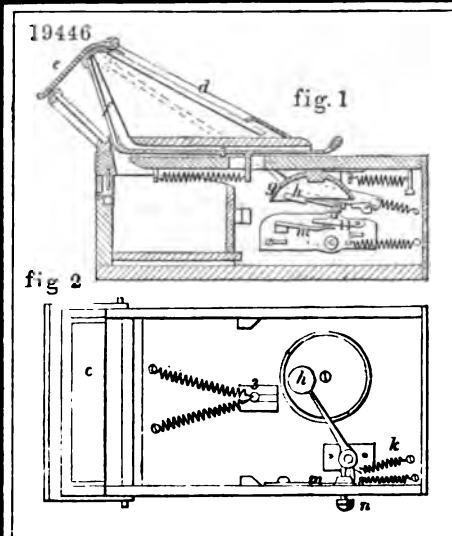


fig. 2



20675

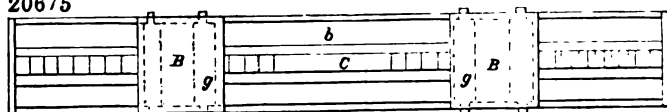


fig. 1

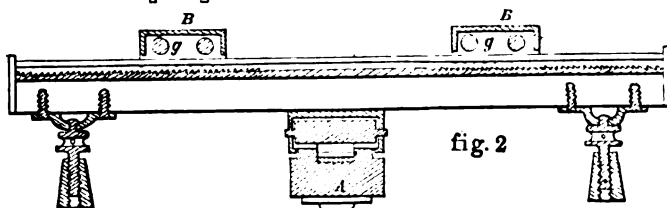
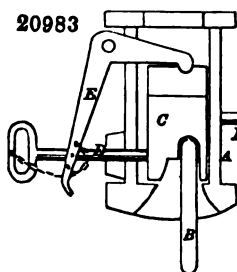


fig. 2

20983



21600



21028

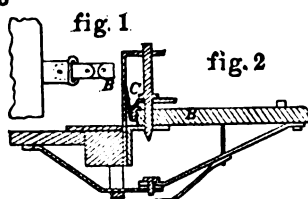


fig. 1

fig. 2

21409

fig. 1

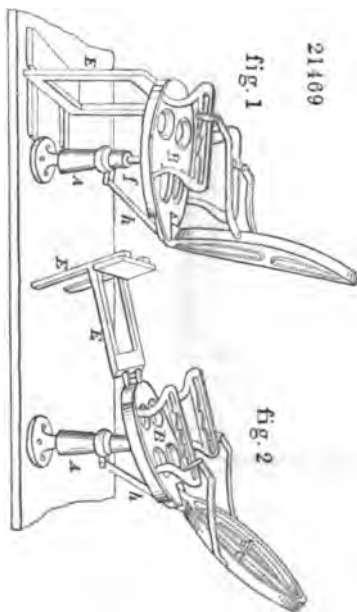
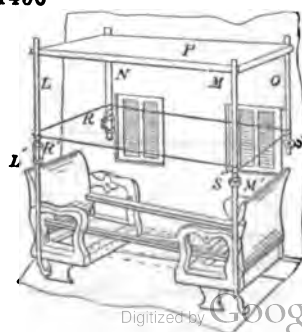
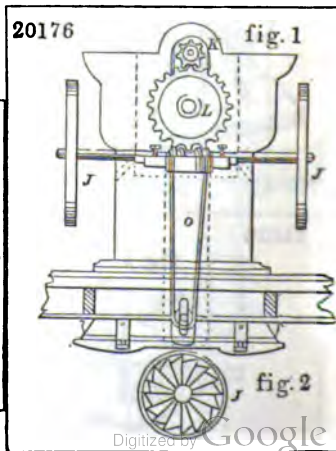
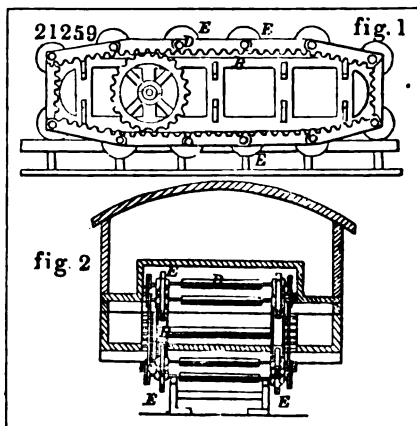
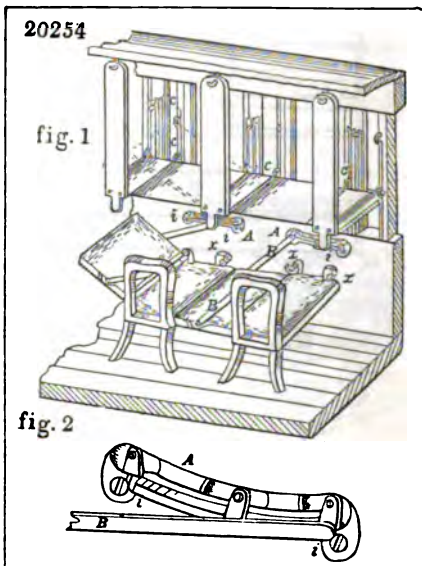
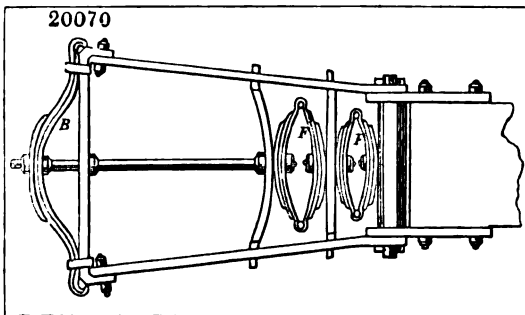
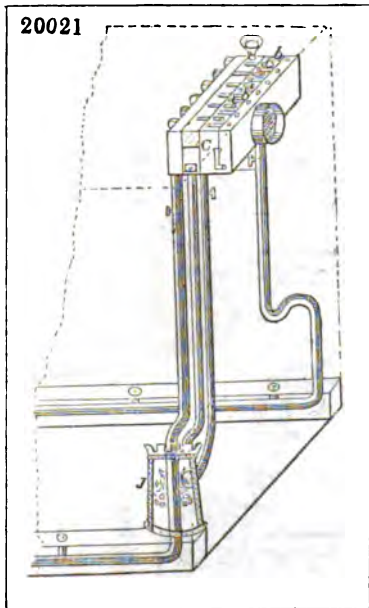
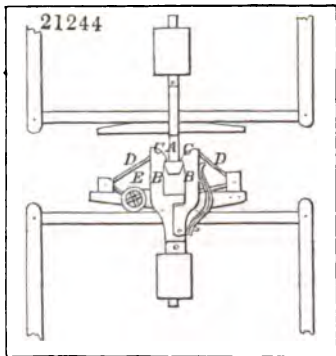


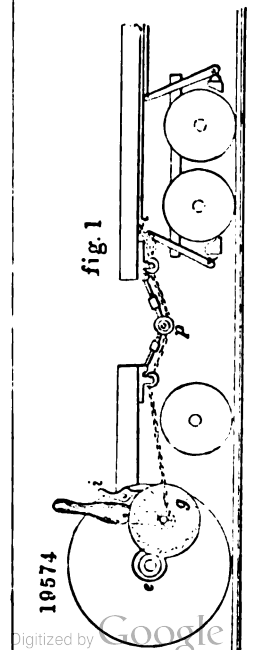
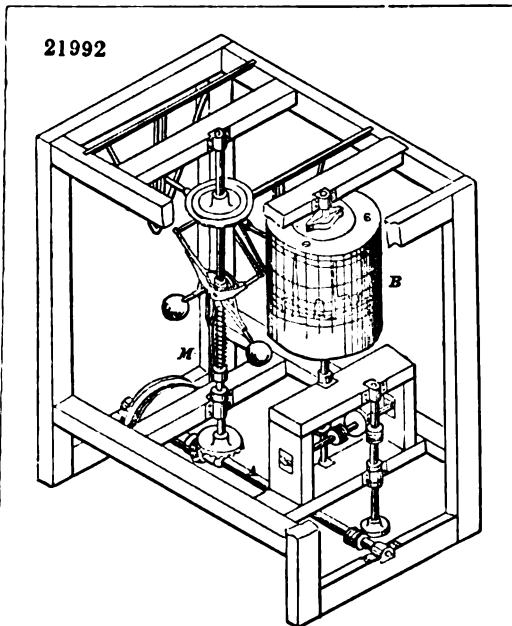
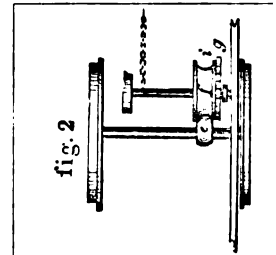
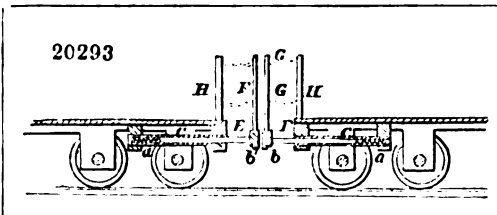
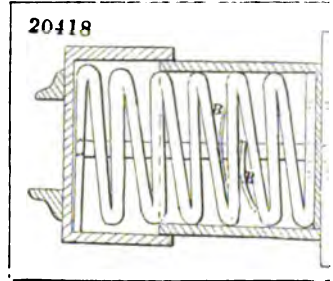
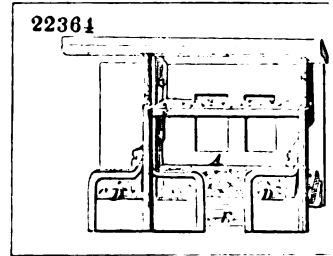
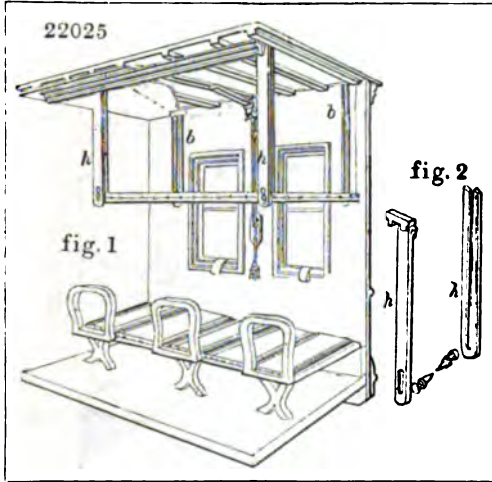
fig. 2

21436









19331

fig. 1

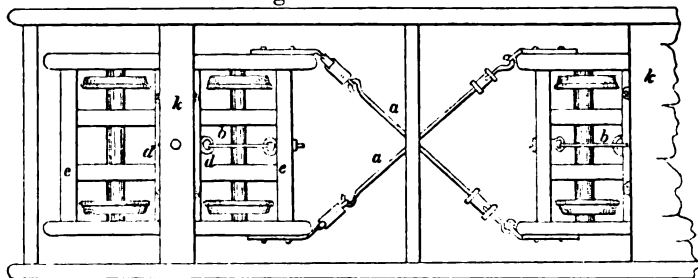


fig. 2

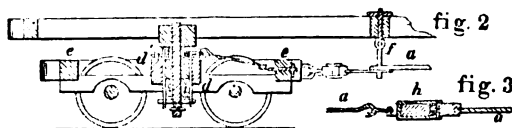
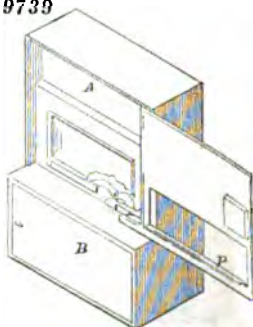


fig. 3



19739



21070

fig. 1

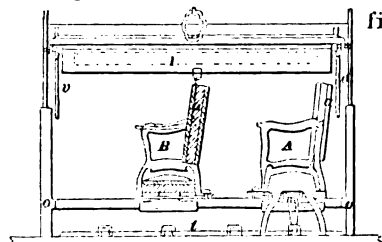
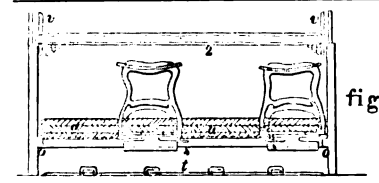


fig. 2



20507

fig. 1

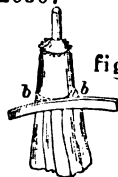


fig. 2



21099

fig. 1

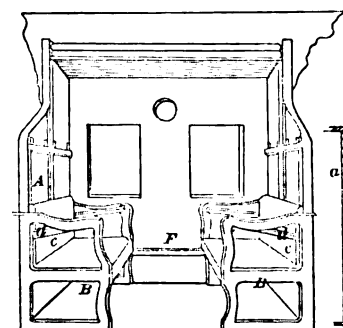
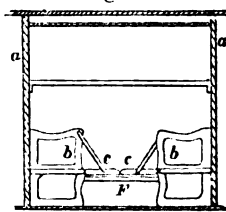
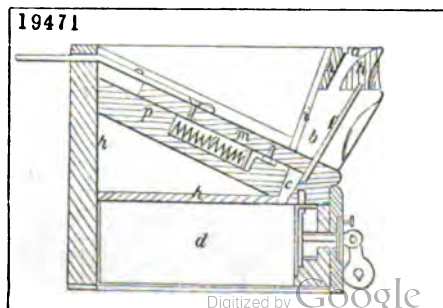
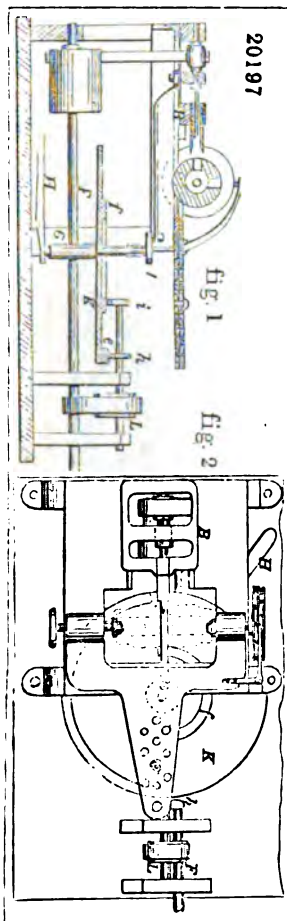
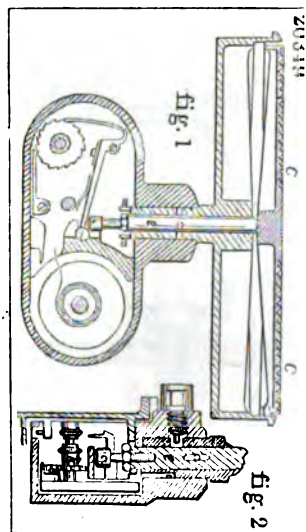
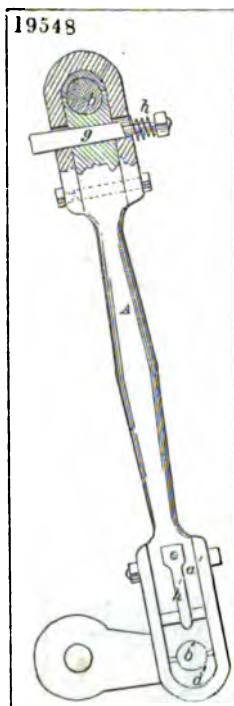
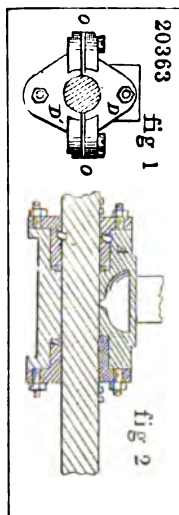
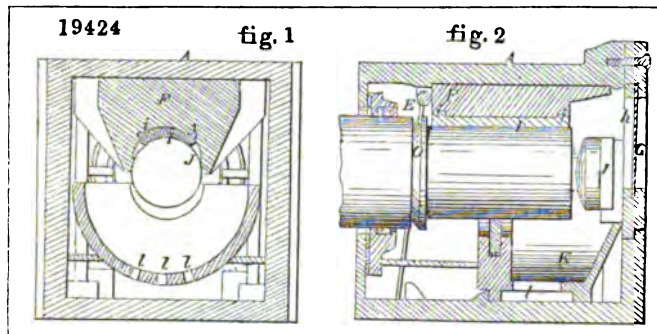


fig. 2





19765

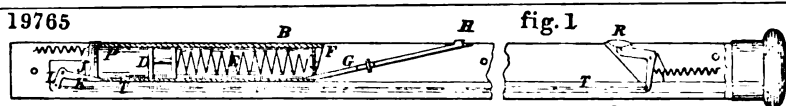


fig. 1

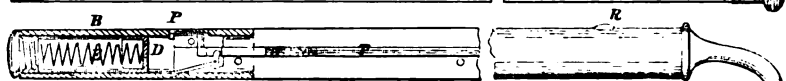


fig. 2

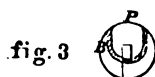


fig. 3

20986

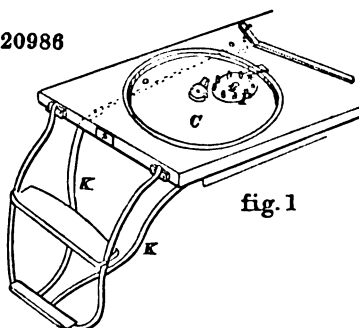


fig. 1

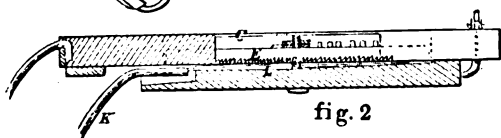


fig. 2

19980

fig. 2

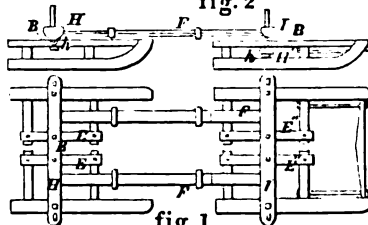
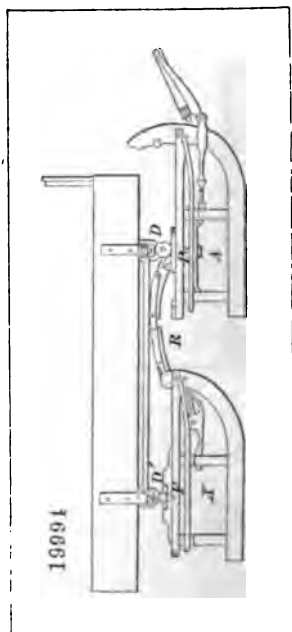
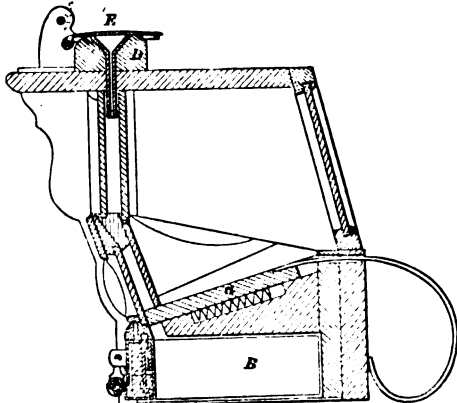


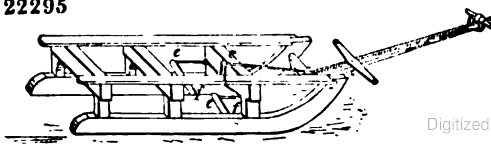
fig. 1

21372



18991

22295





20903

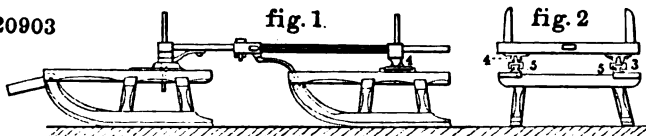
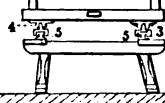


fig. 1

fig. 2

fig. 3



21255

fig. 2

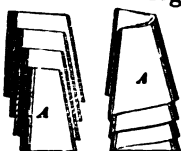
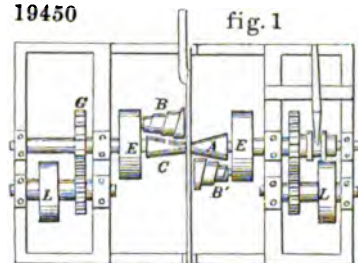


fig. 1

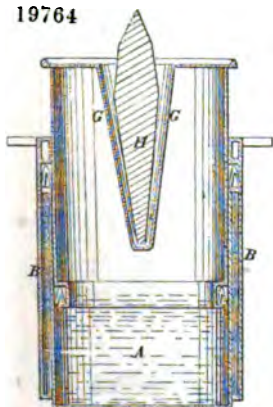
19450

fig. 1

fig. 2



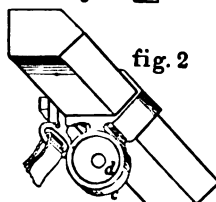
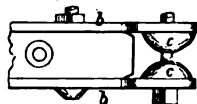
19764



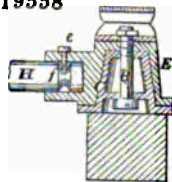
20033

fig. 1

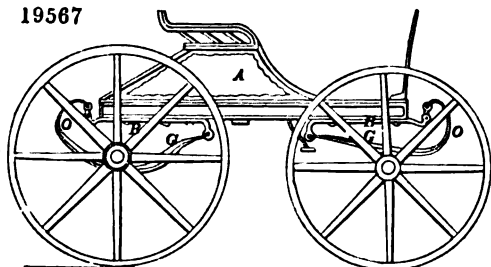
fig. 2



19558



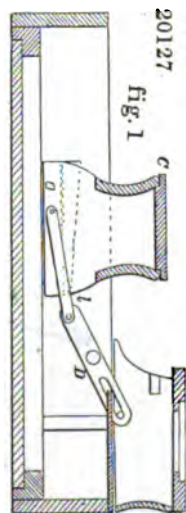
19567

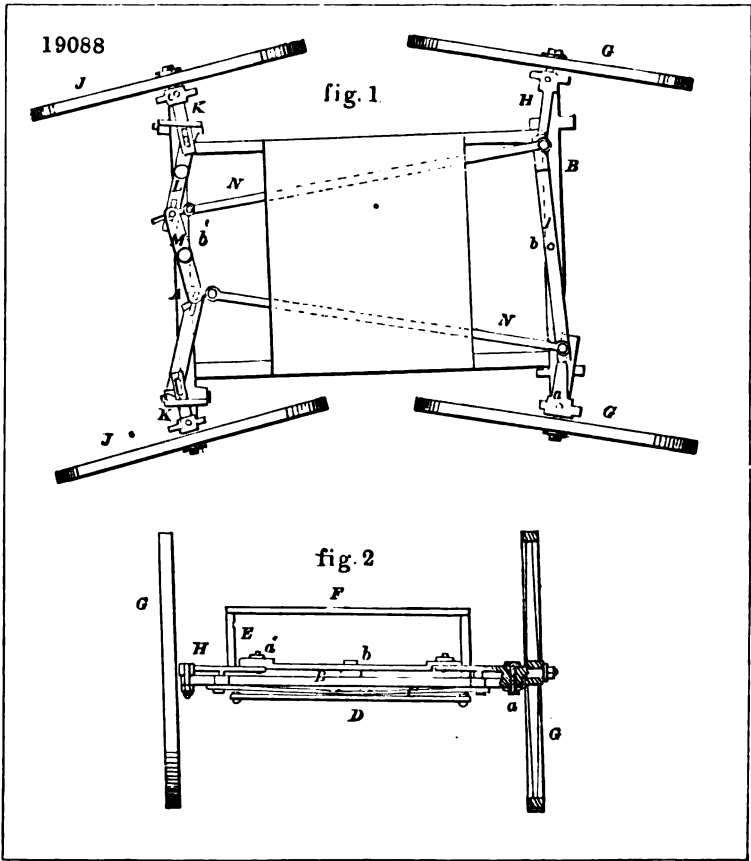
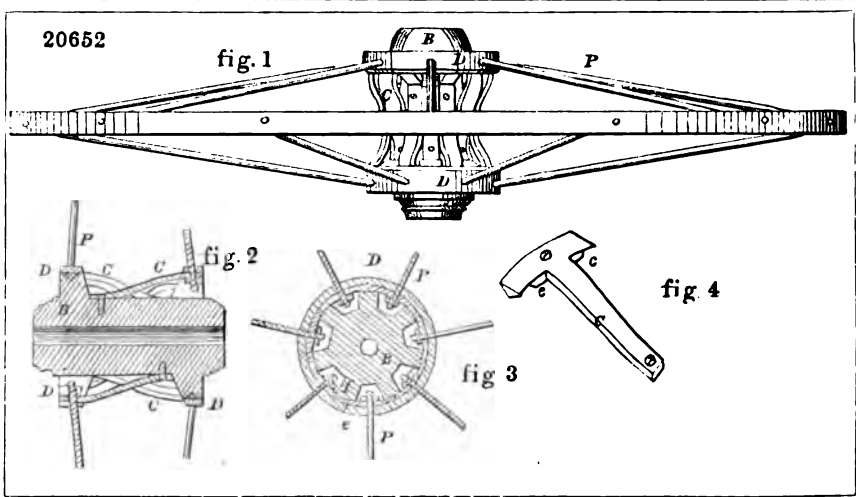


20127

fig. 1

fig. 2





19477

fig. 1

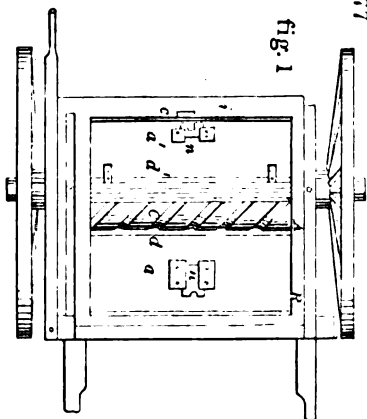
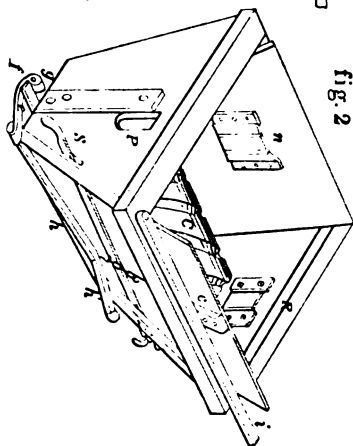


fig. 2



19092

fig. 1

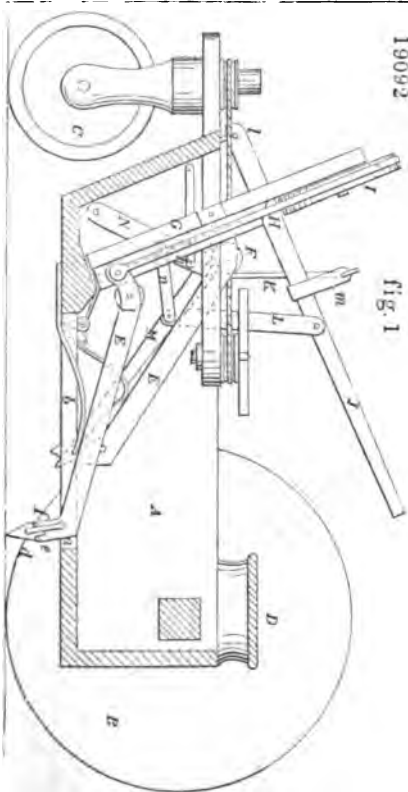
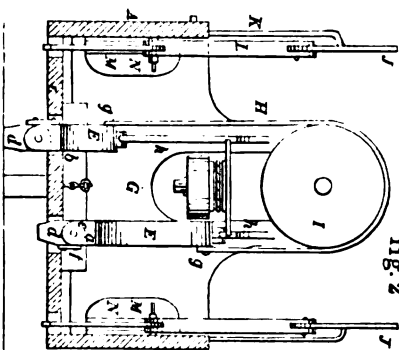
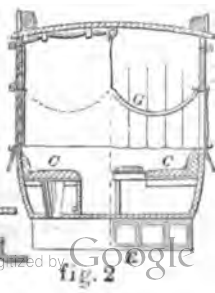
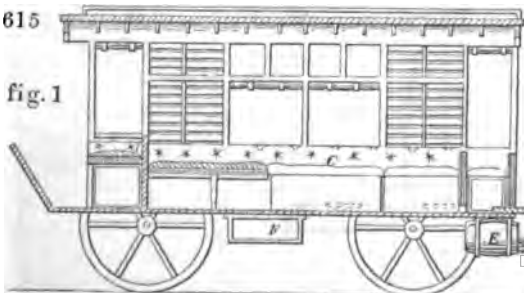


fig. 2

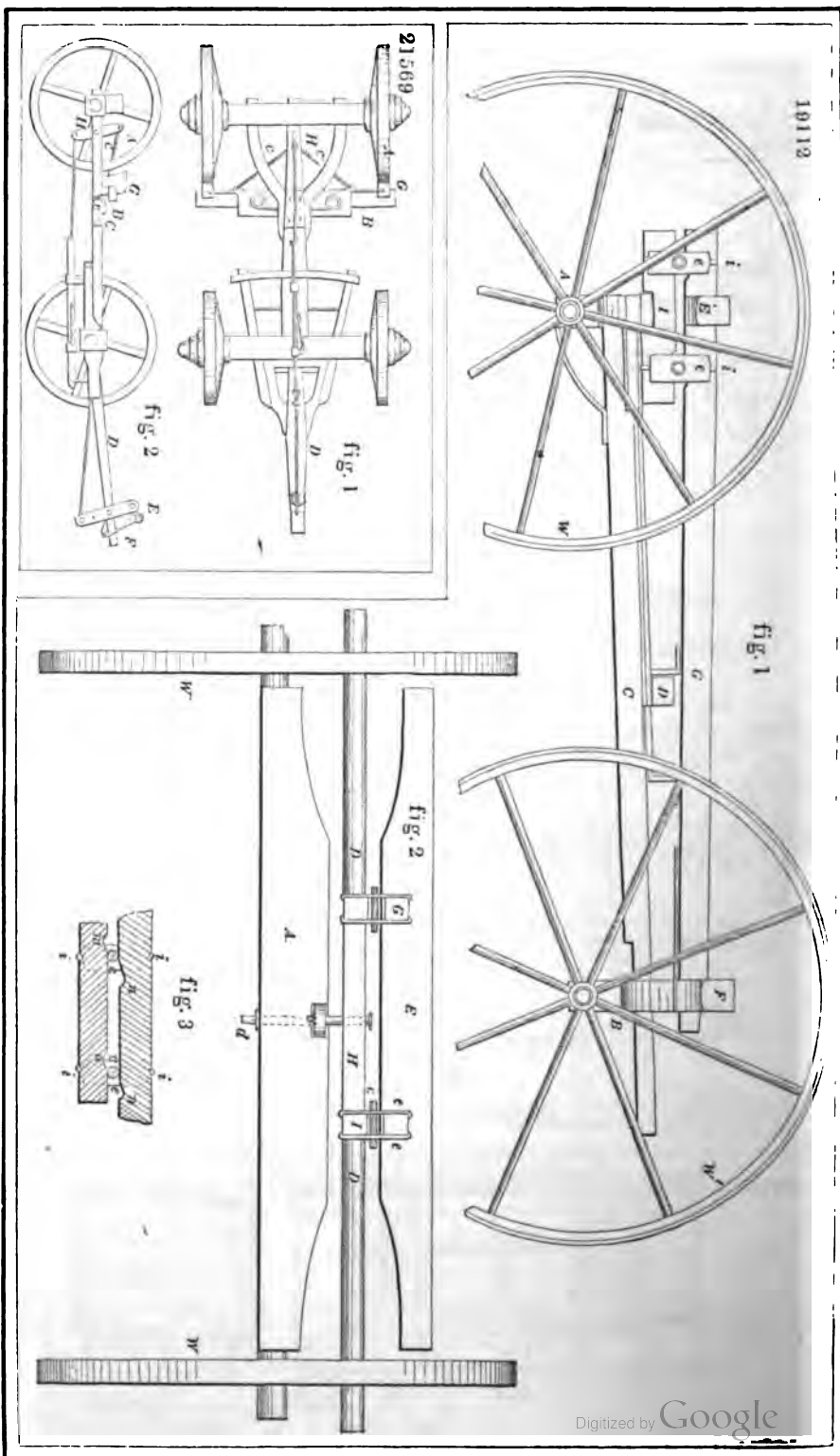


21615

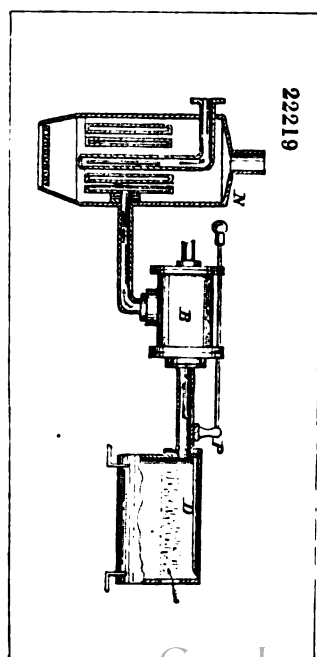
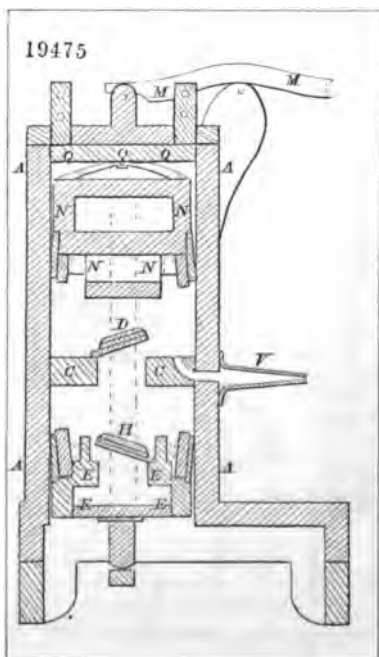
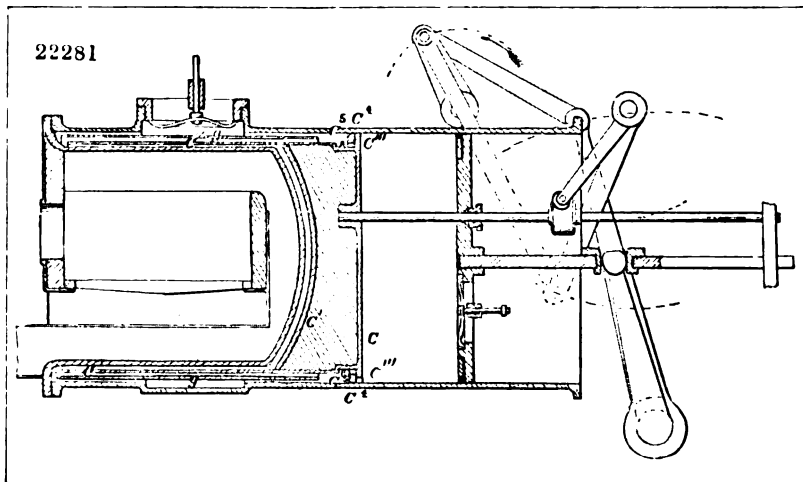
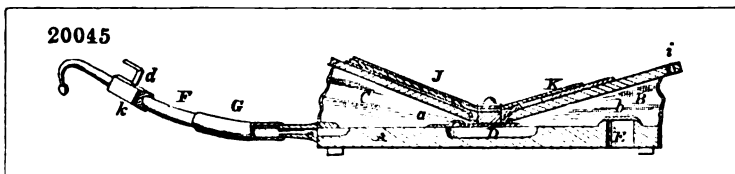
fig. 1

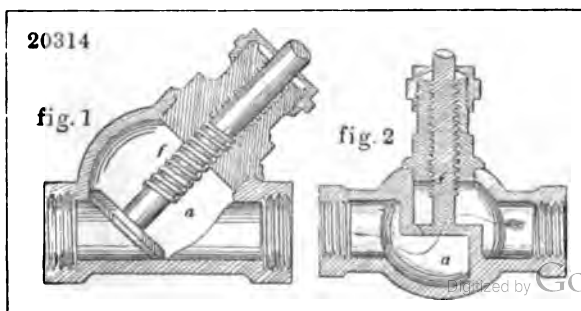
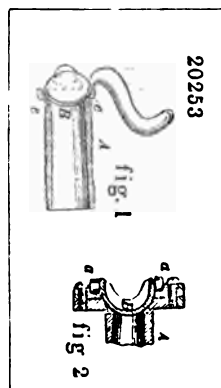
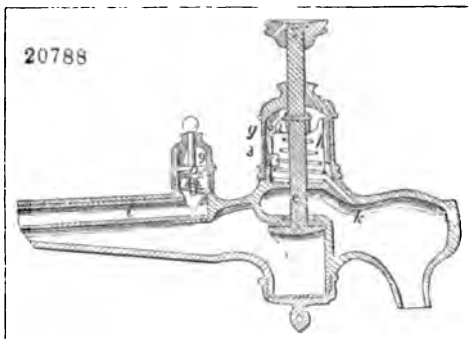
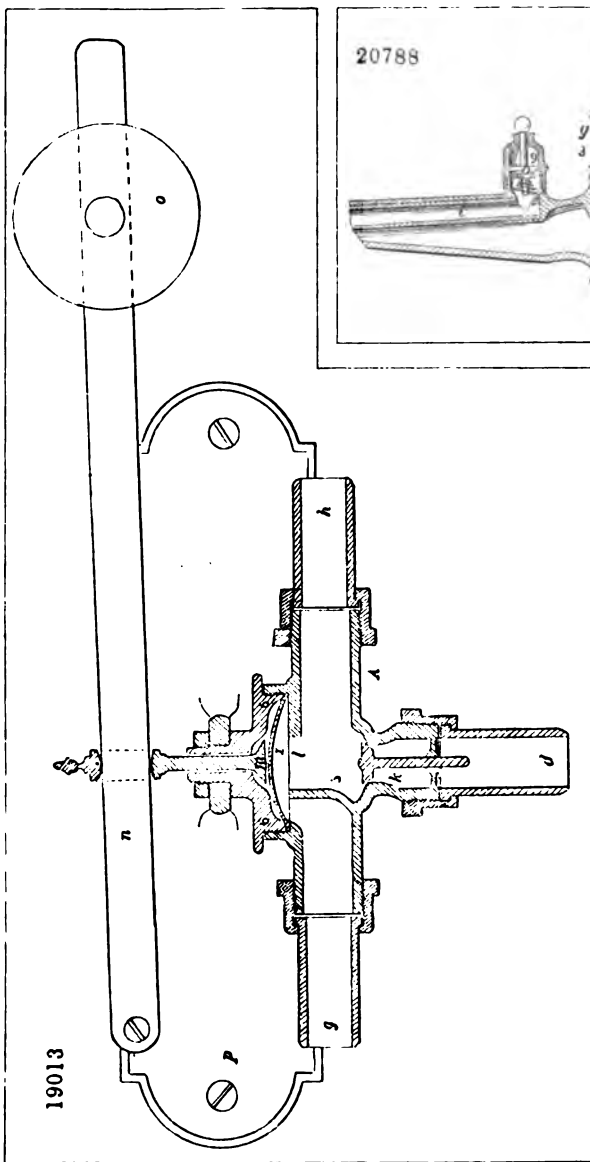




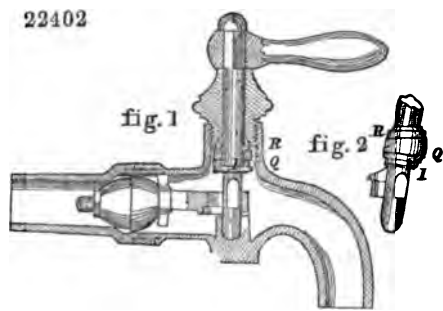




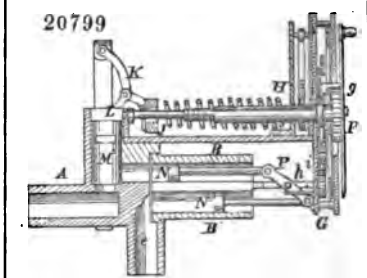




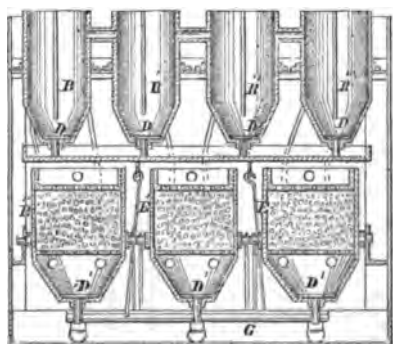
22402



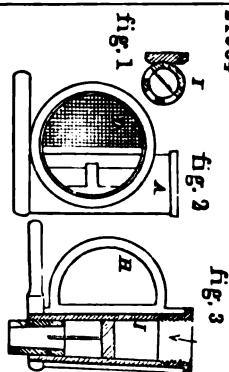
20799



19929



21064



19335

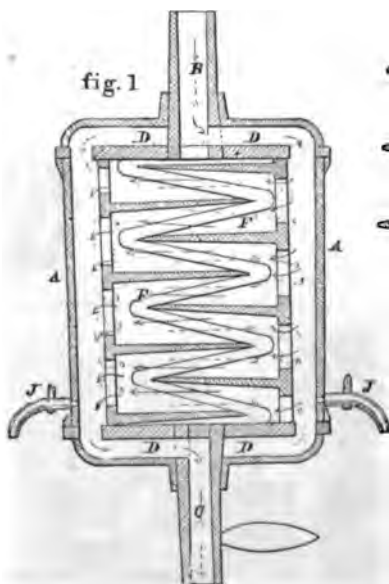


fig. 2

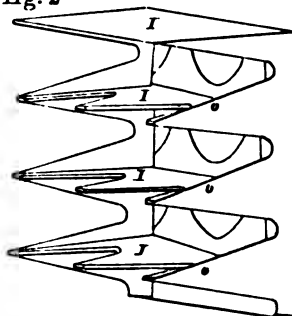
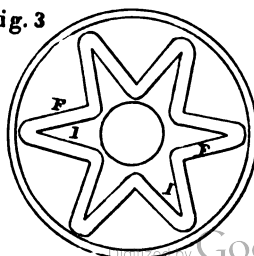
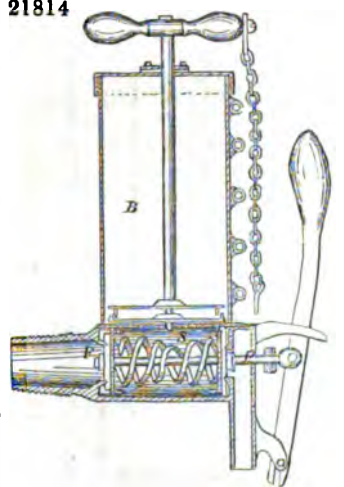


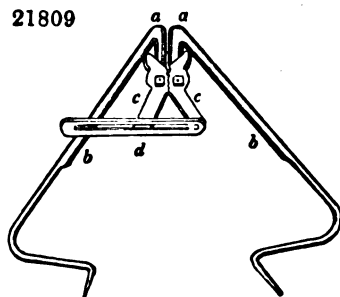
fig. 3



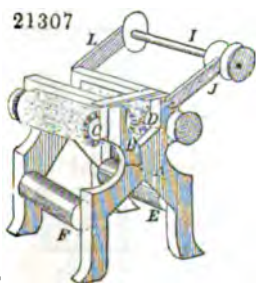
21814



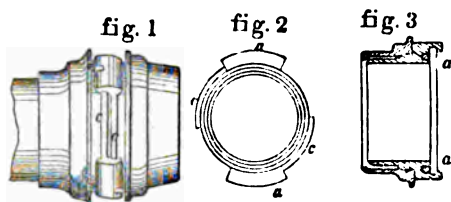
21809



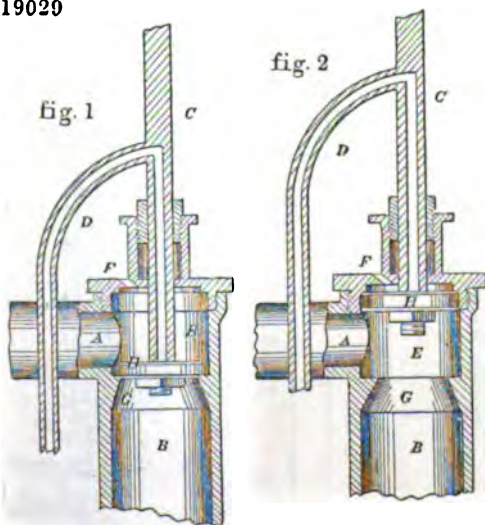
21307



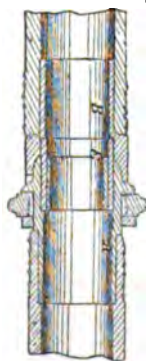
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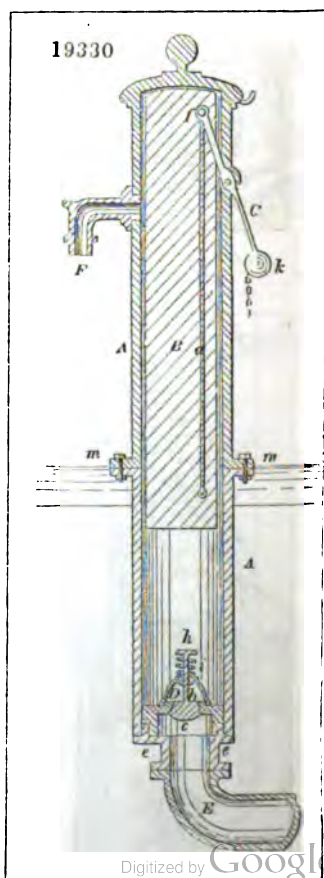
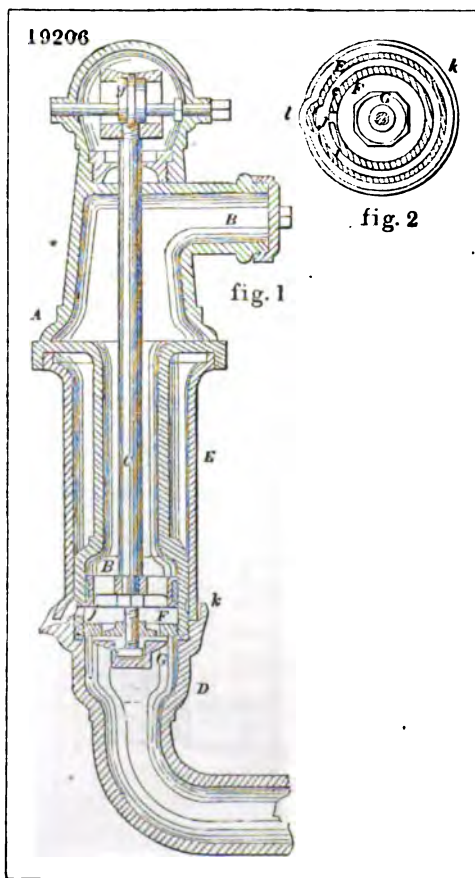
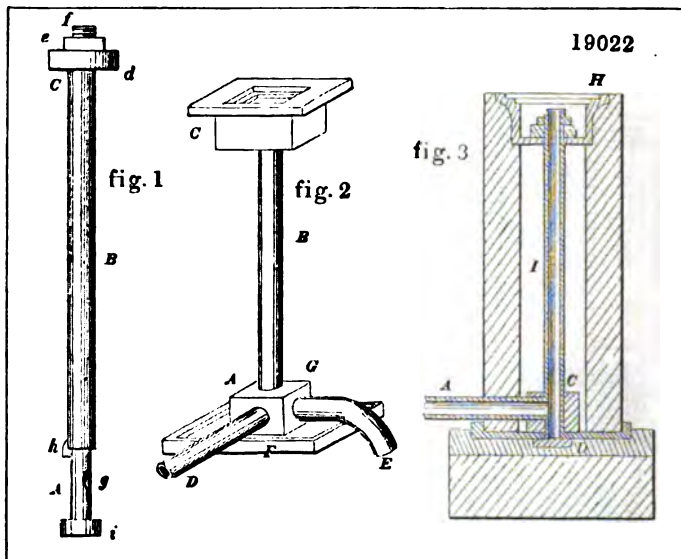


19020

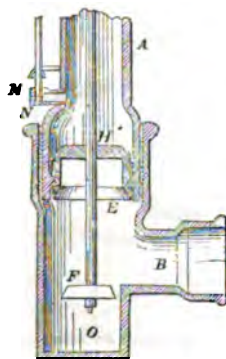
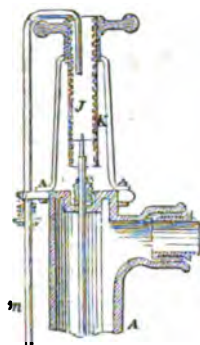


20532

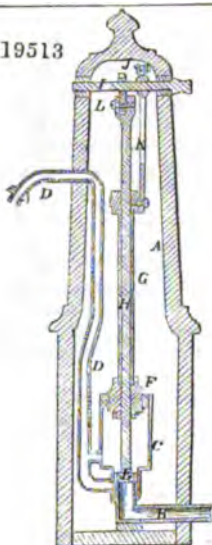




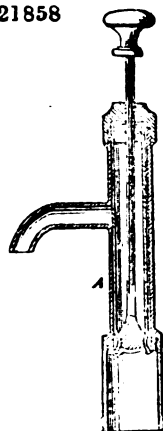
19511



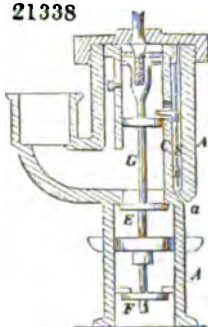
19513



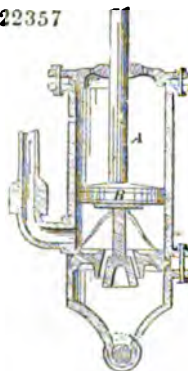
21858



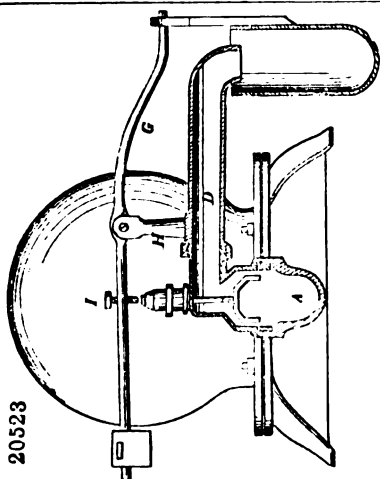
21338



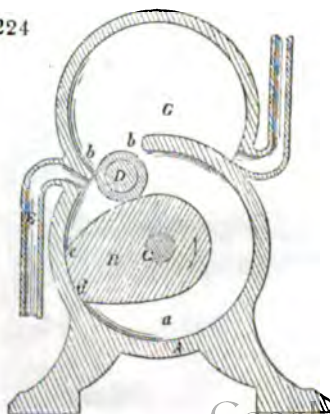
22357



20523



19224





19398

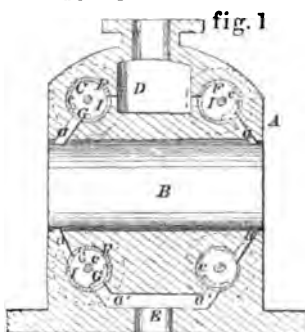
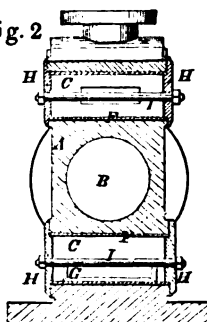


fig. 2



20842

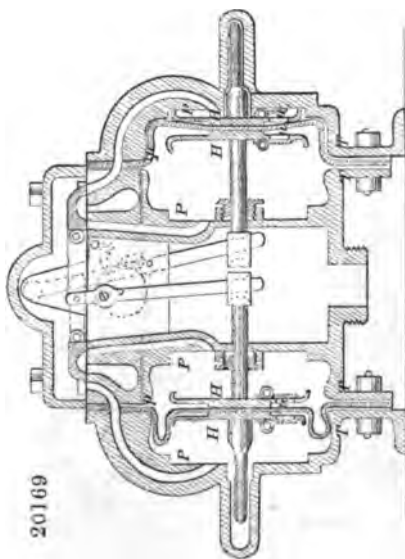
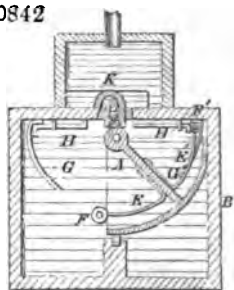


fig. 2

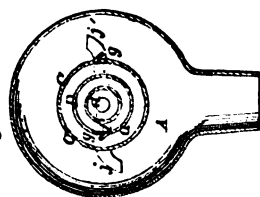
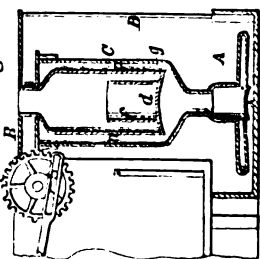
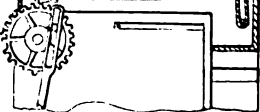


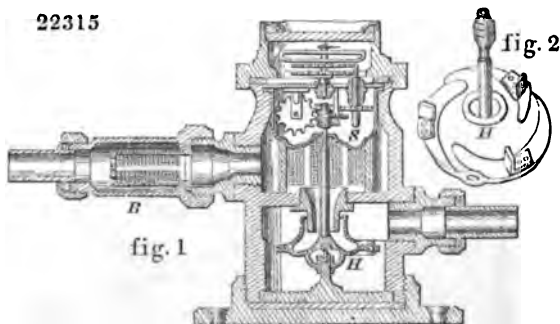
fig. 1



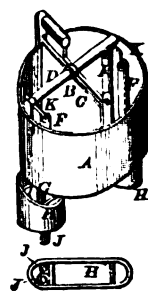
19414



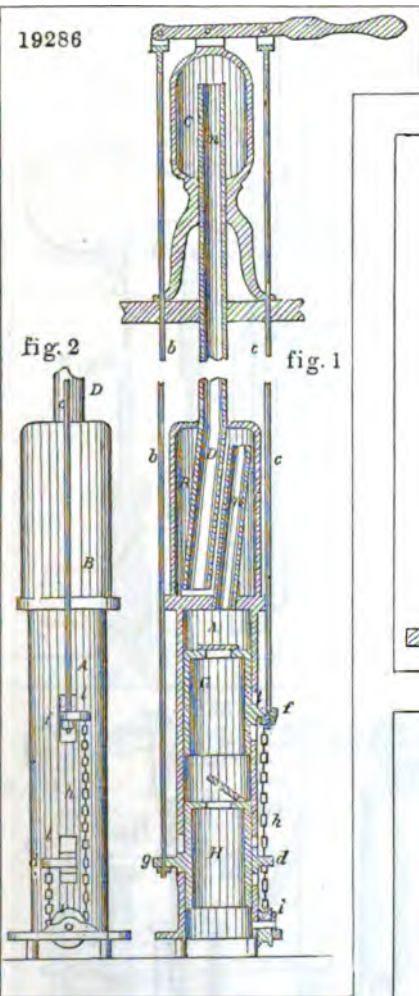
22315



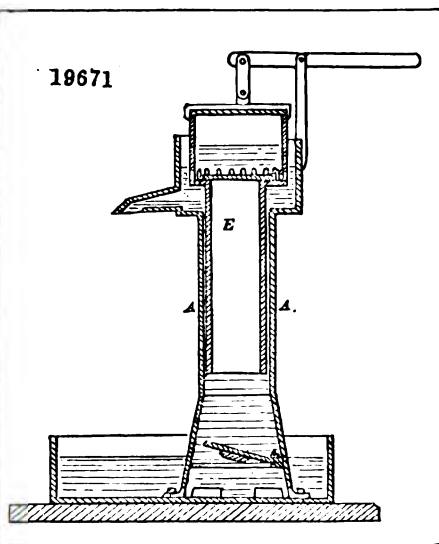
20979



19286



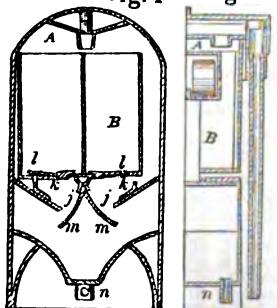
19671



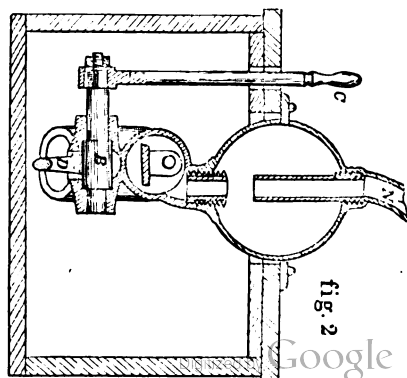
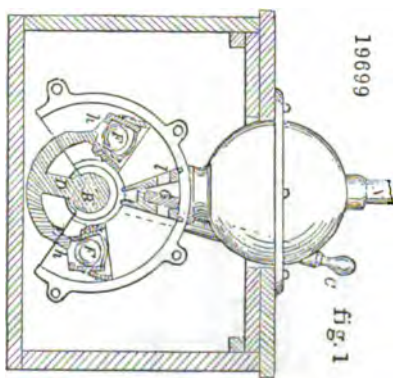
21283

fig. 1

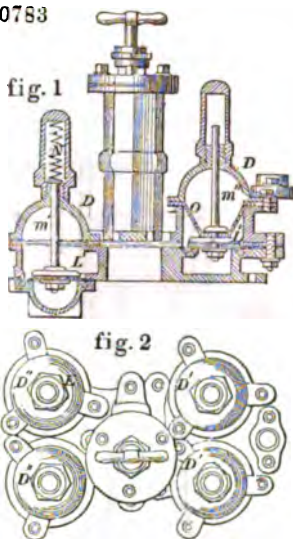
fig. 2



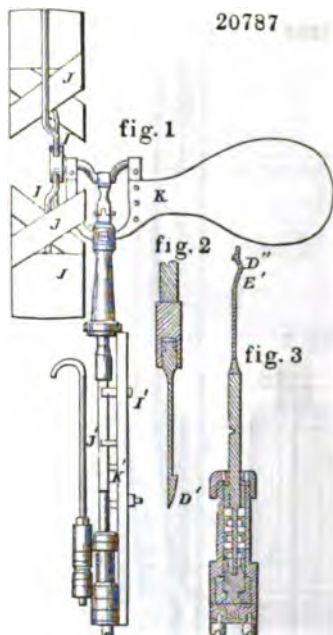
19699



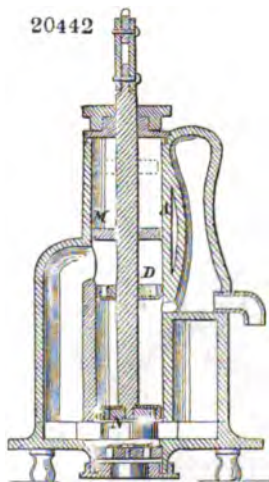
20783



20787



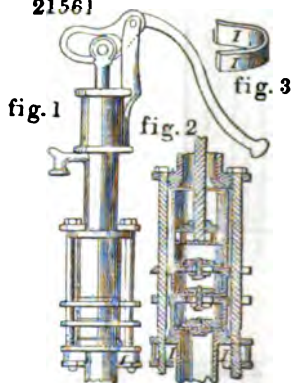
20442



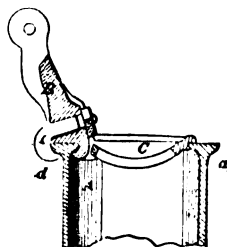
20880



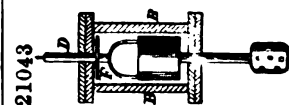
21561



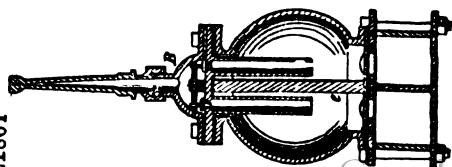
**21560**



21043



21801



22201

fig. 3



fig. 1

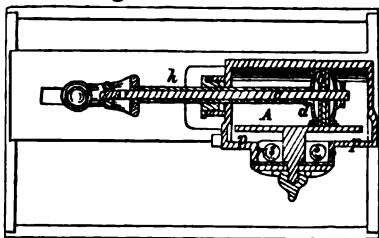
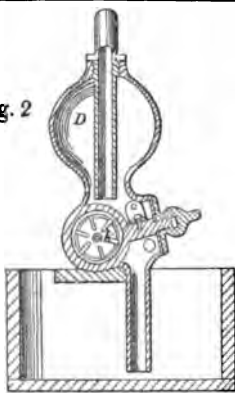
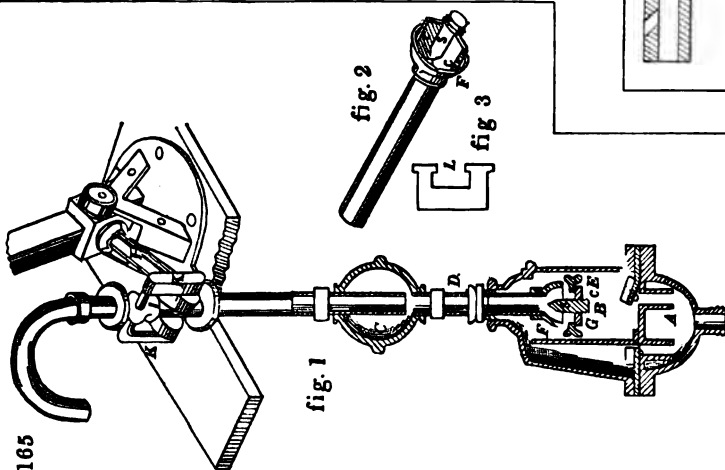
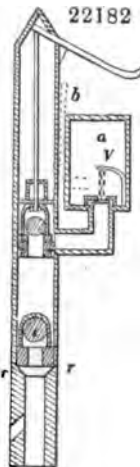


fig. 2



22182



22165

19981

fig. 1

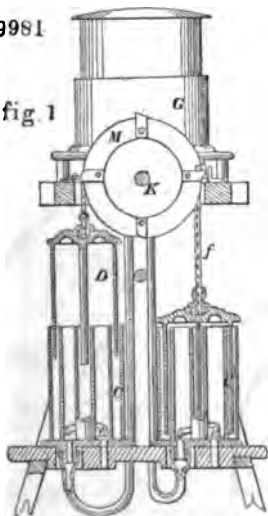
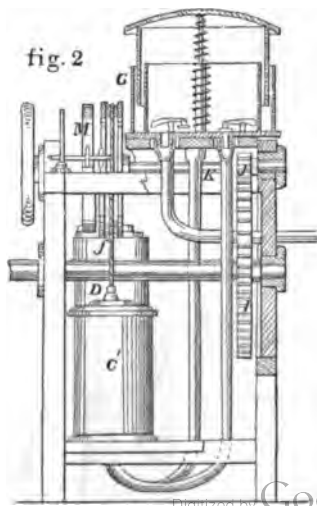


fig. 2



19173

fig. 1

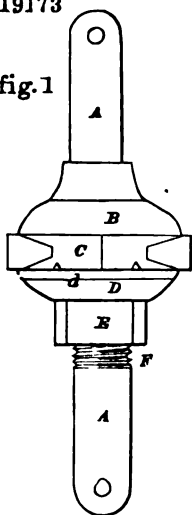
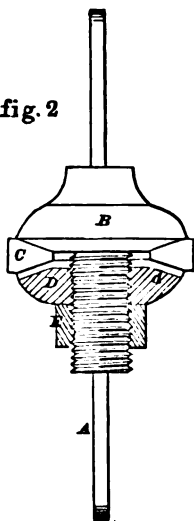


fig. 2



20443

fig. 1

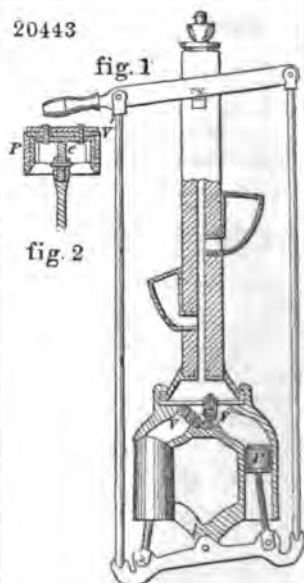


fig. 2

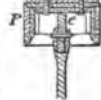


fig. 2

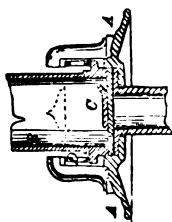
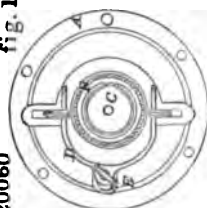
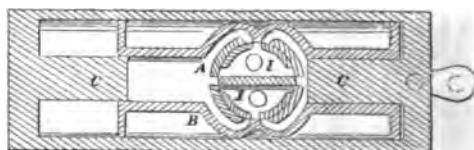


fig. 1



20060

19680



21756

fig. 1

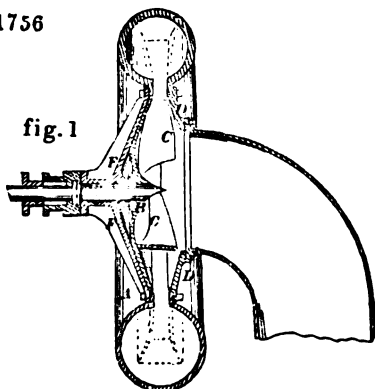
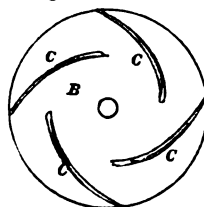
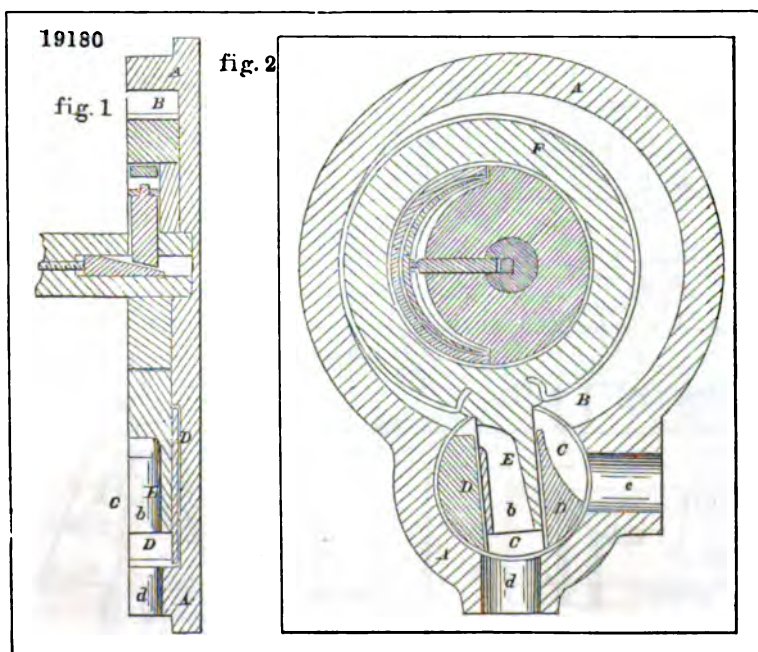
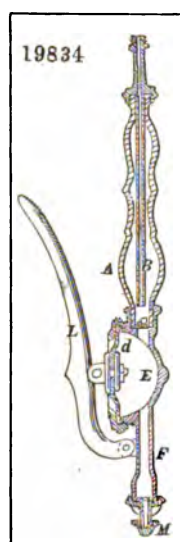
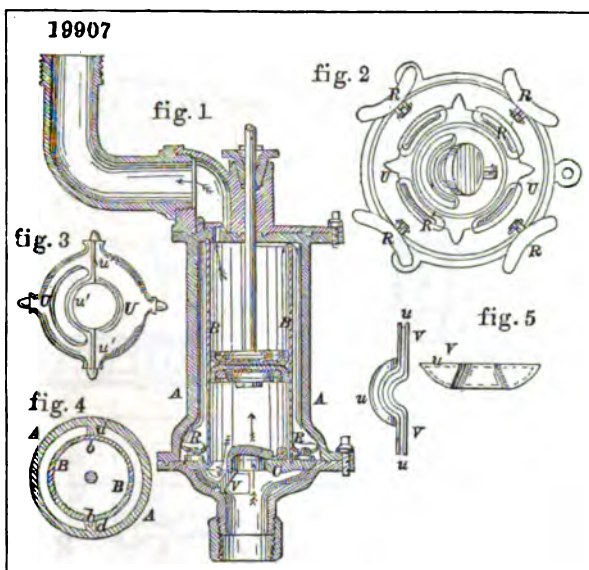


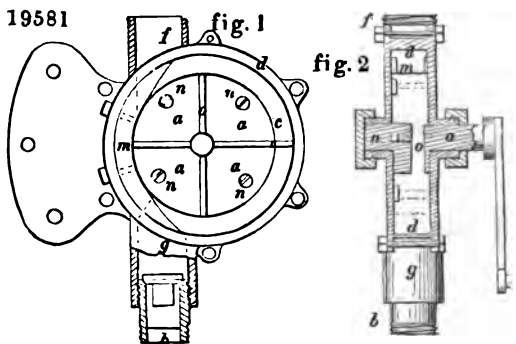
fig. 2







19581



21318

fig 1

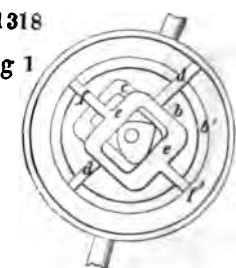
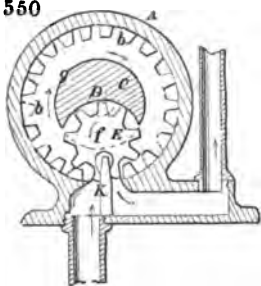


fig. 2



21550



21632

fig. 1

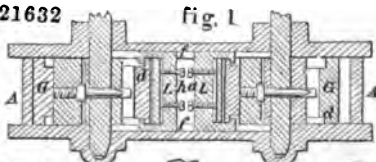
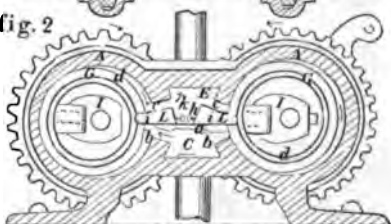
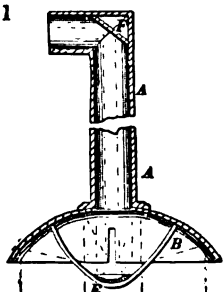


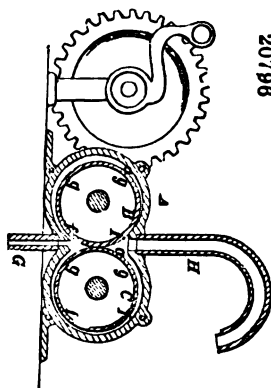
fig. 2



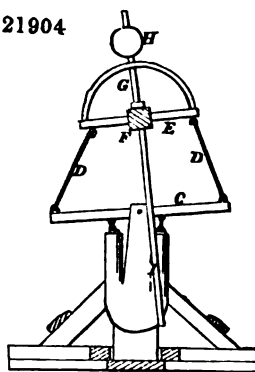
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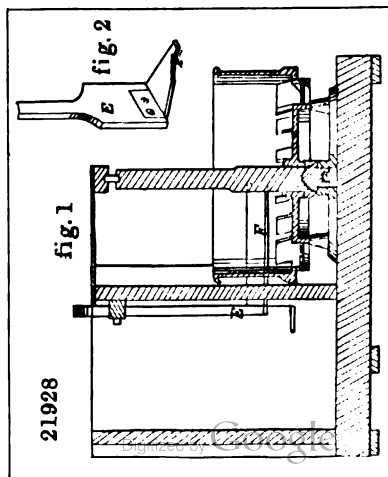
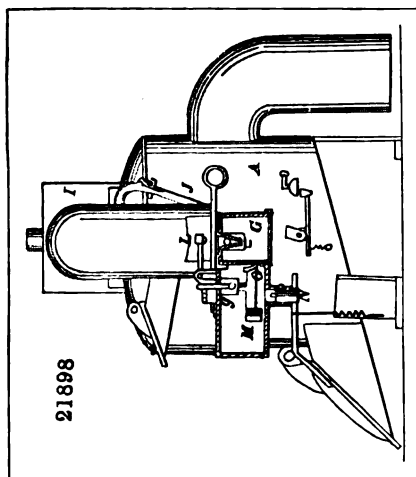
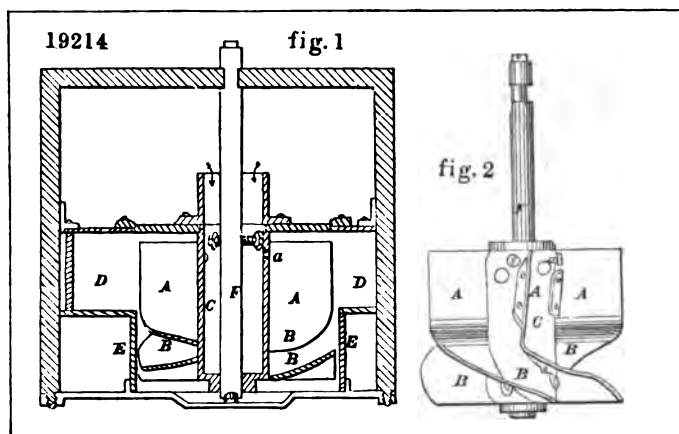
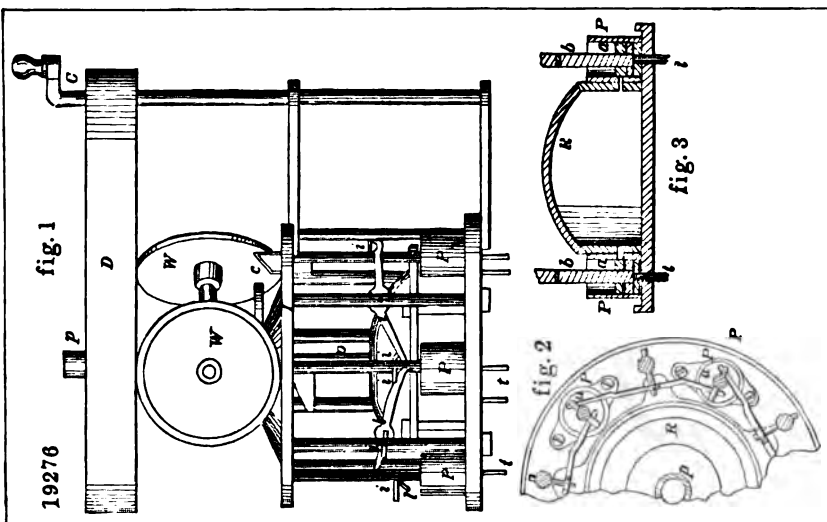


20798



21904







20187

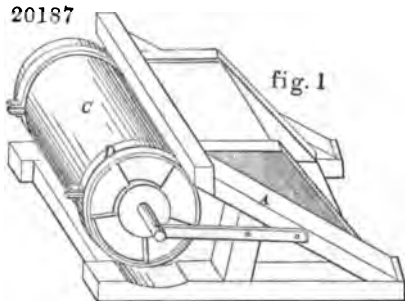
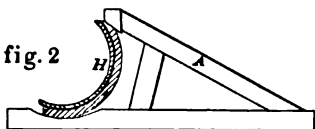


fig. 1

fig. 2



20234

fig 1

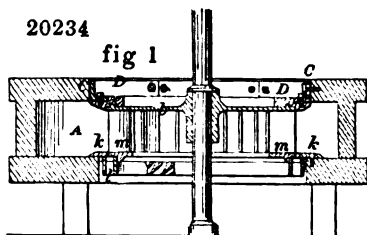
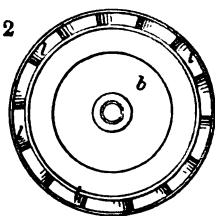
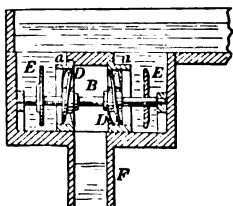


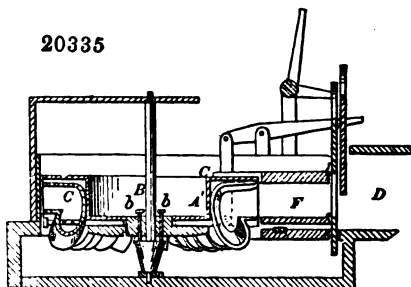
fig. 2



20200



20335



20456

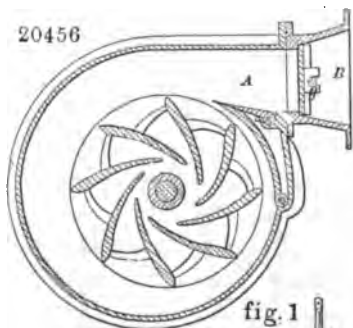
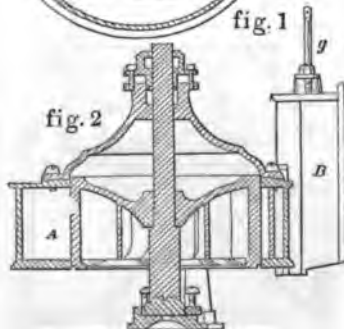
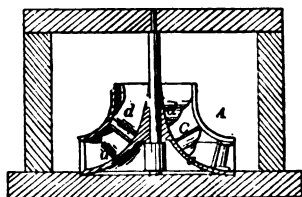


fig. 1

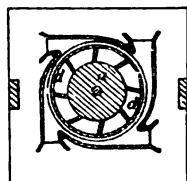
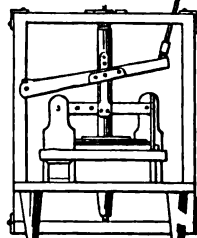
fig. 2



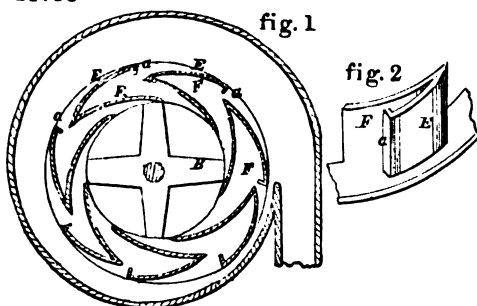
21578



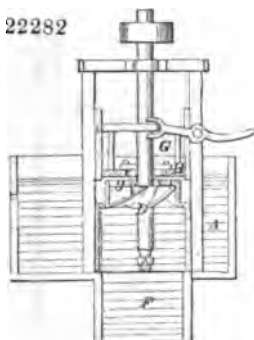
20921 fig. 1

fig. 2  
fig. 3

21753



22282



21791

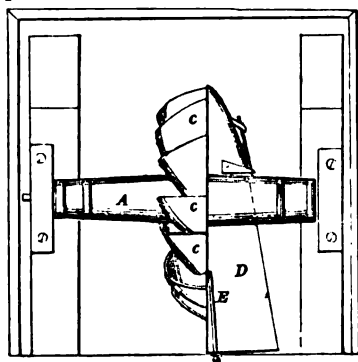
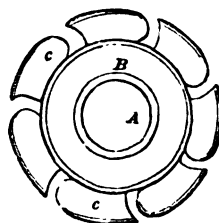
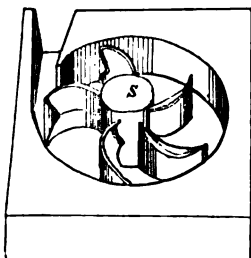


fig. 1

fig. 2



21757



19115

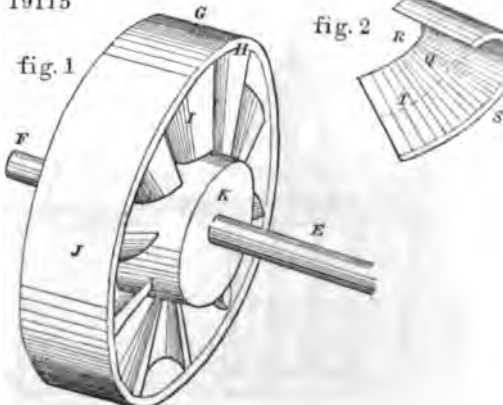


fig. 1

fig. 2

19383

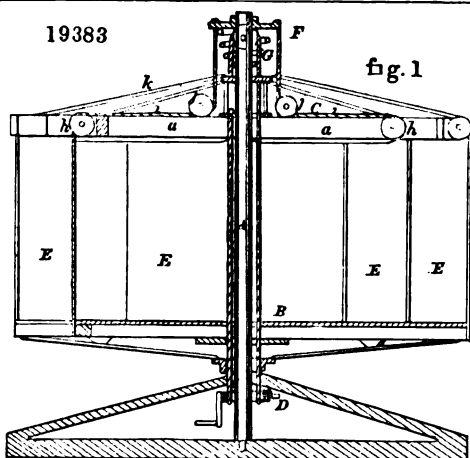
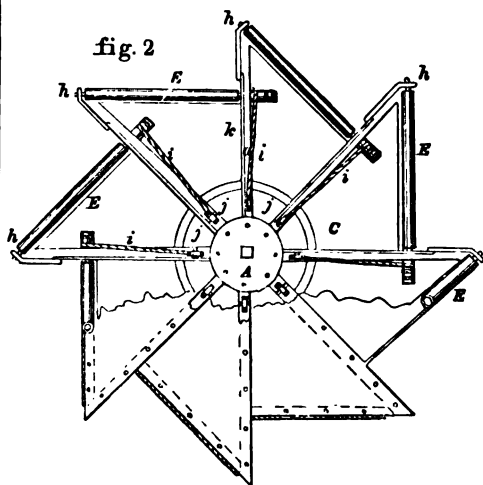
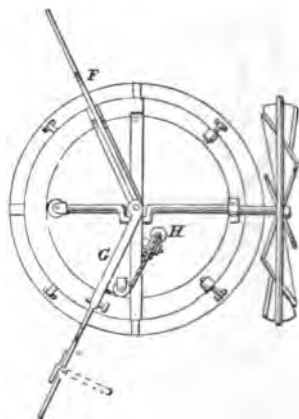


fig. 1

fig. 2



20336



20437

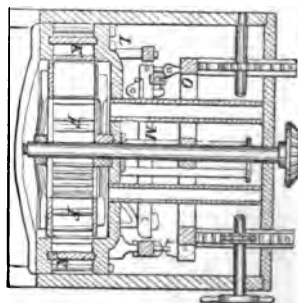
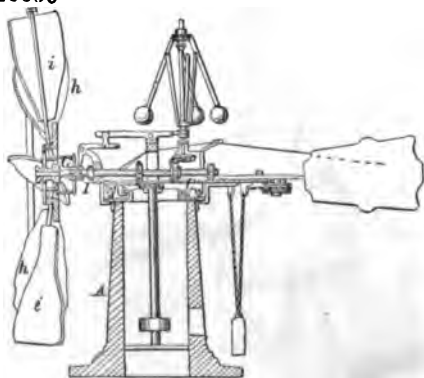


fig. 1

fig. 2

20350



19330

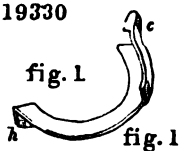


fig. 1

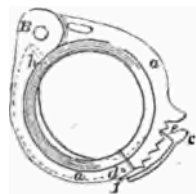


fig. 1

21520

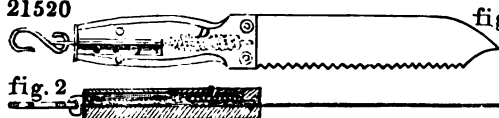
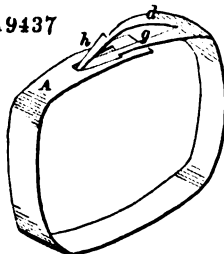


fig. 1

fig. 2



19437



21517

fig. 2

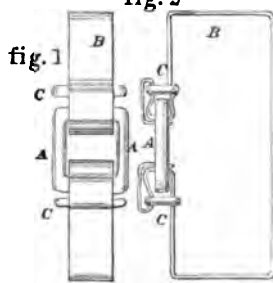


fig. 1

21305



19709

fig. 1

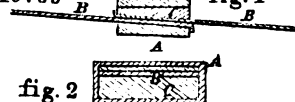


fig. 2

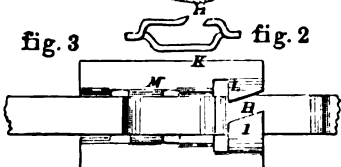
19490

fig. 1



fig. 3

fig. 2

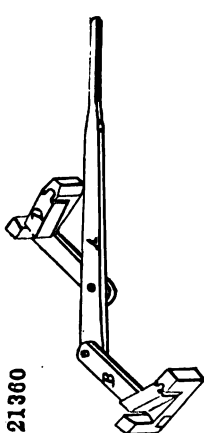
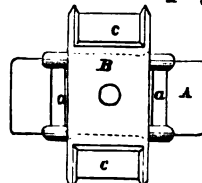


20311

fig. 2

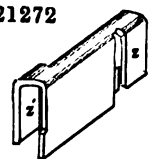


fig. 1



21360

21272



21190

fig. 1

fig. 2

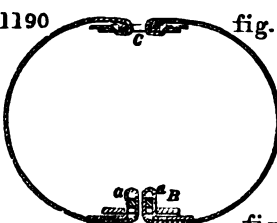


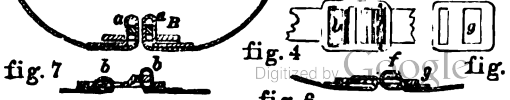
fig. 3

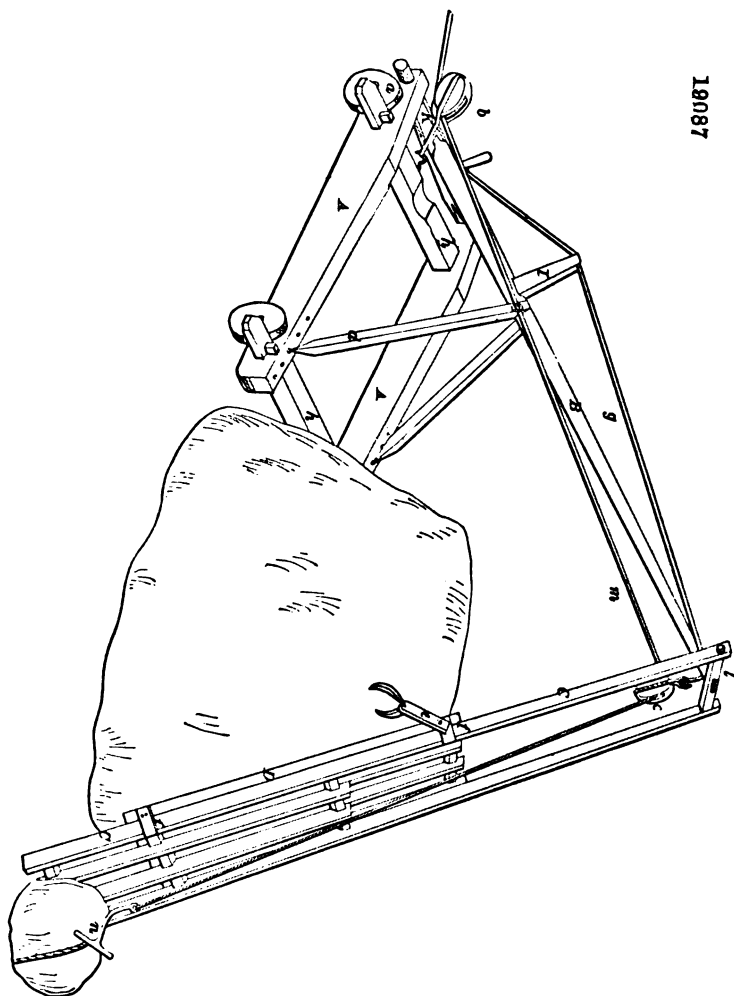
fig. 4

fig. 5

fig. 7

fig. 6

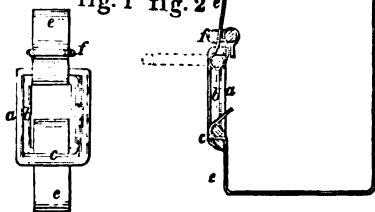




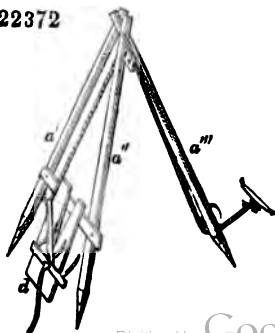
18087

21848

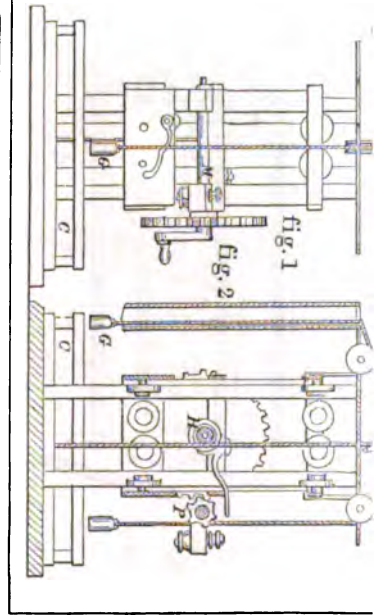
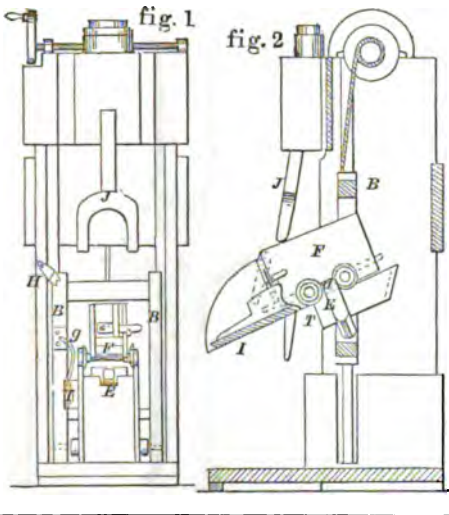
fig. 1 fig. 2



22372



19939



19250

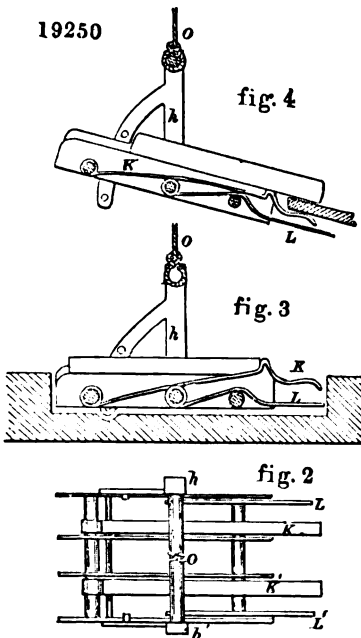


fig. 1

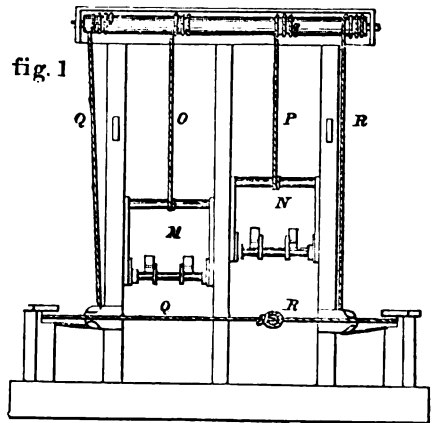


fig. 1

20170

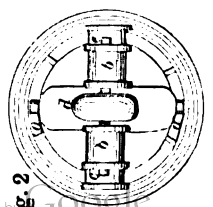
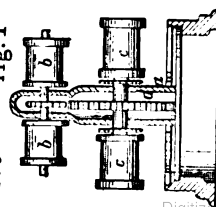
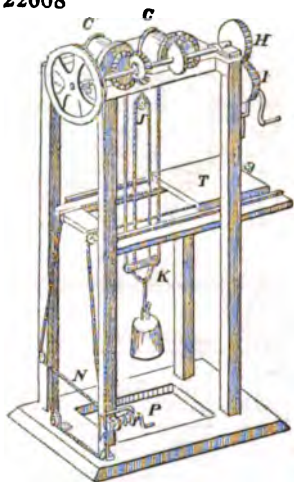
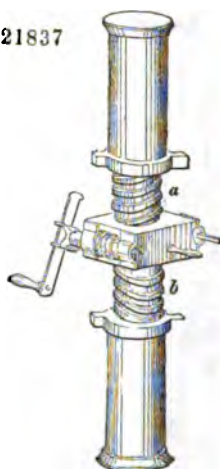


fig. 2

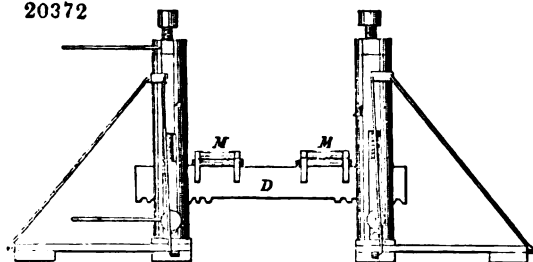
22008



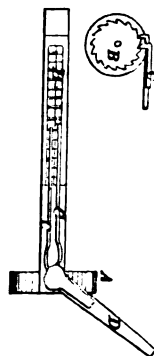
21837



20372



21822



21342

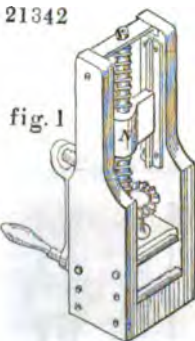


fig. 2

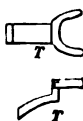
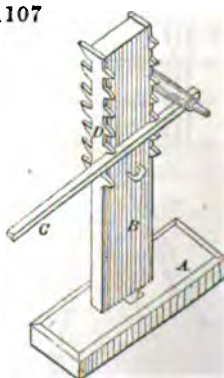


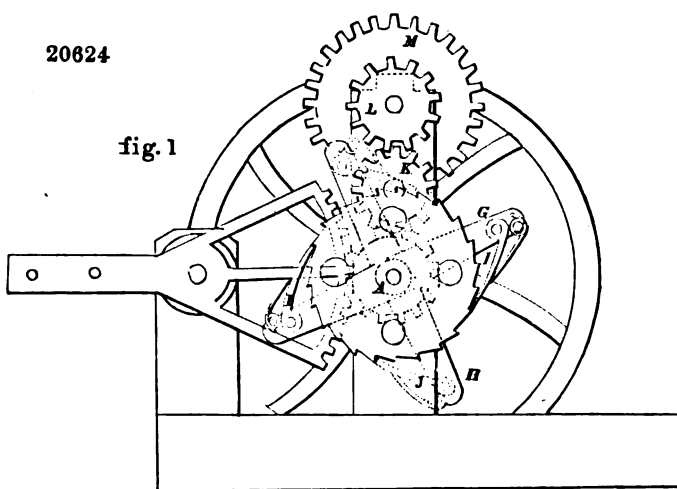
fig. 3

21107

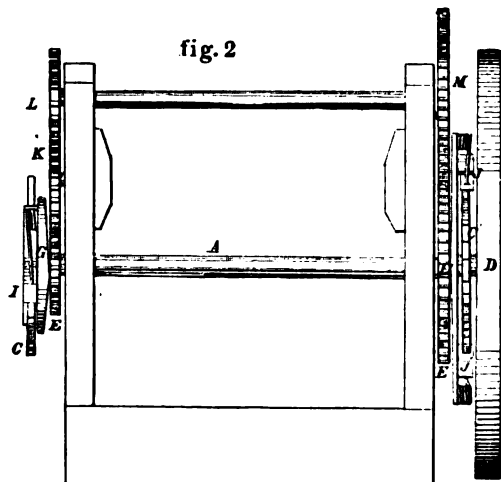


20624

fig. 1



**fig. 2**



19291

fig 1

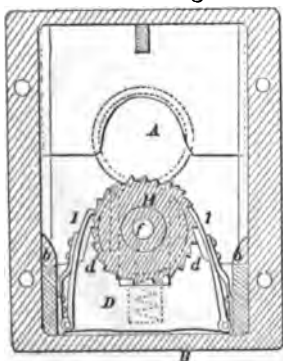
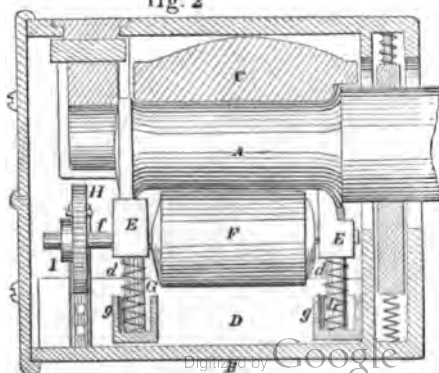


fig. 2





20874

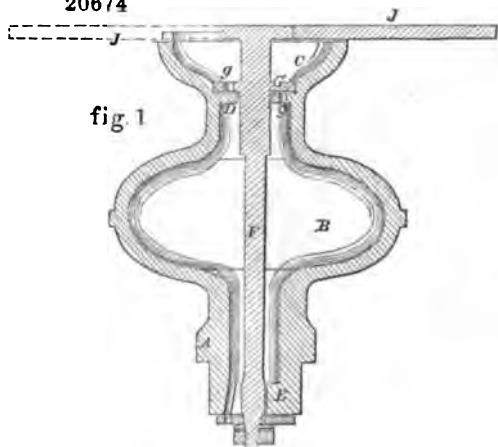
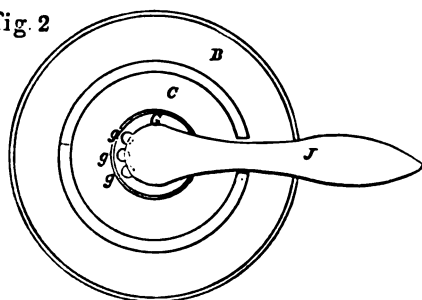
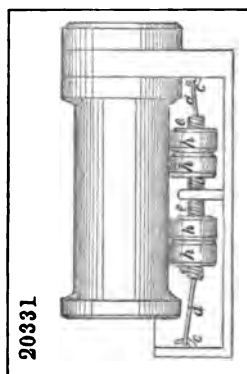


fig. 1

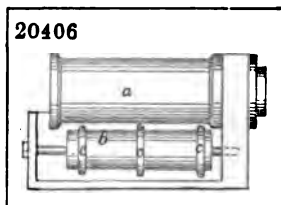
fig. 2



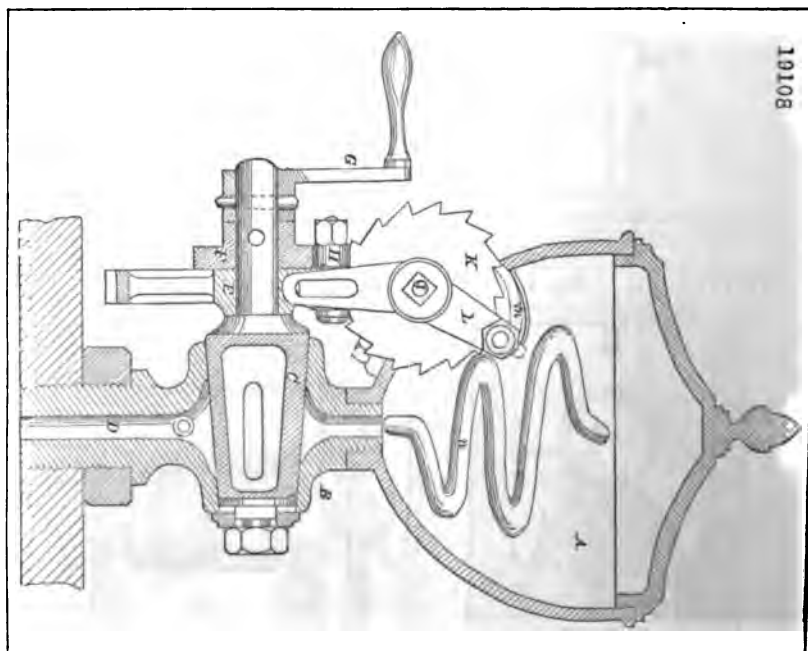
20331

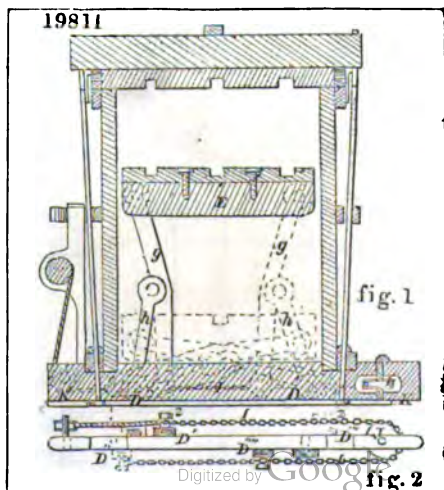
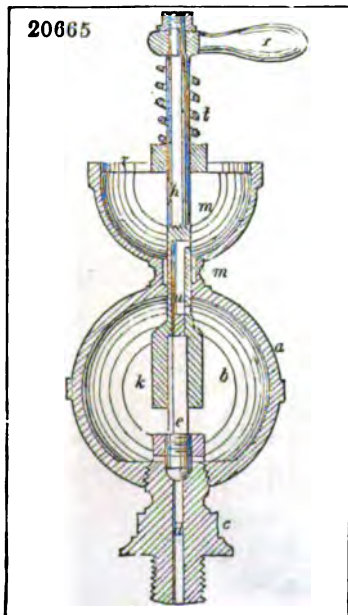
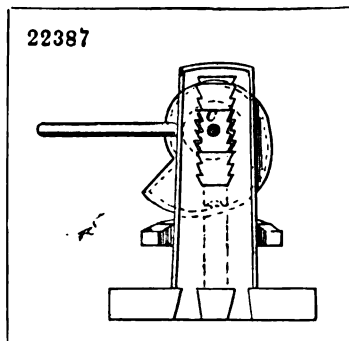
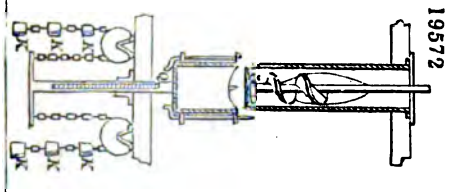
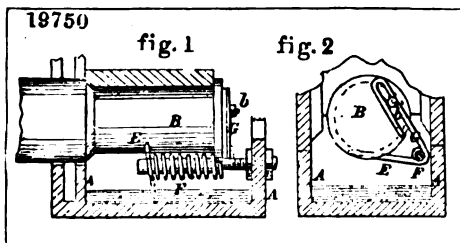
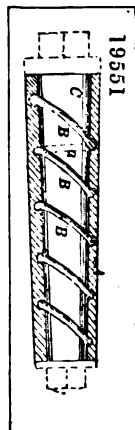
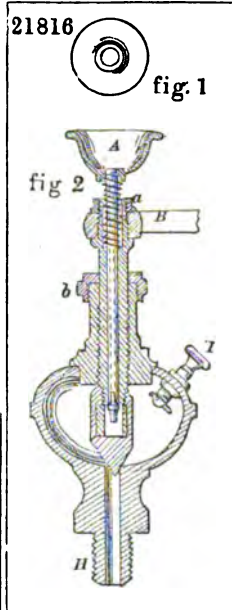
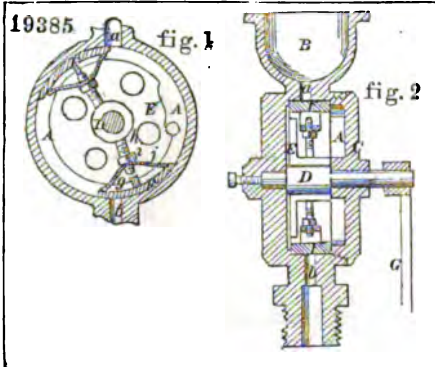


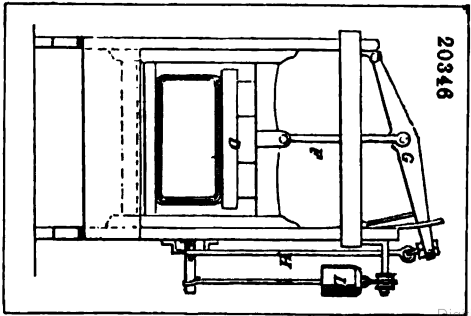
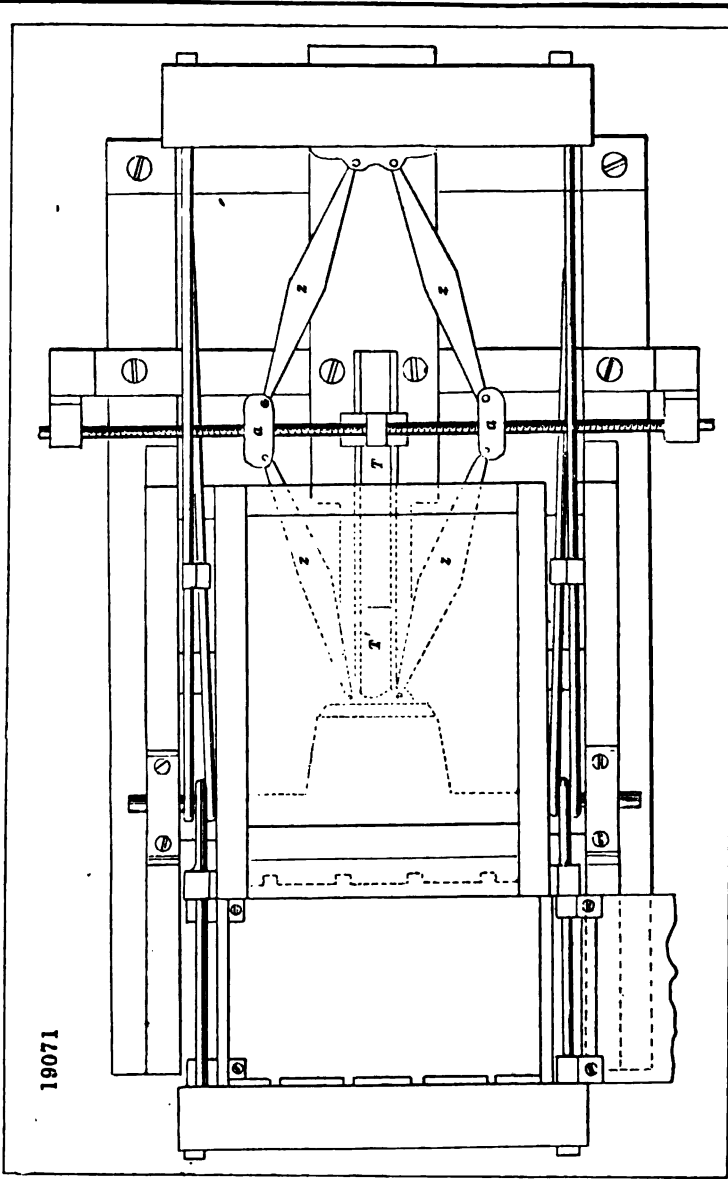
20406

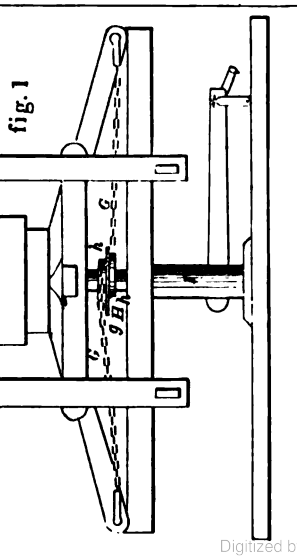
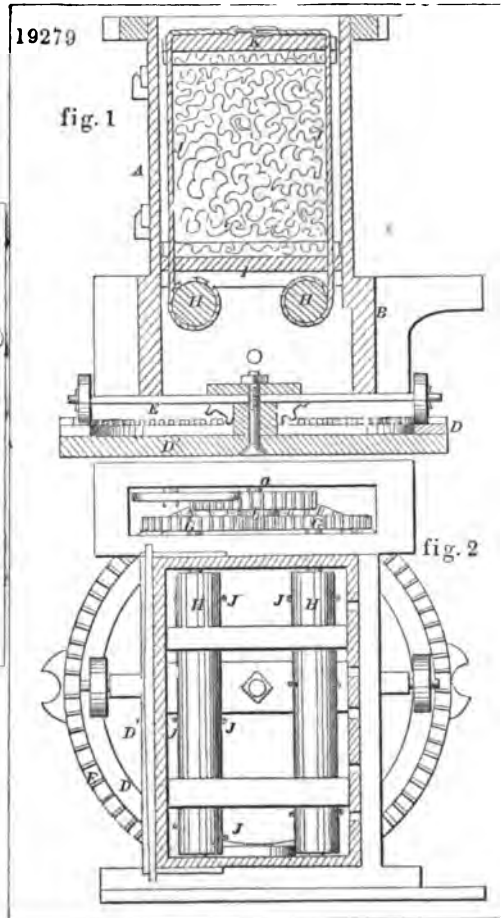
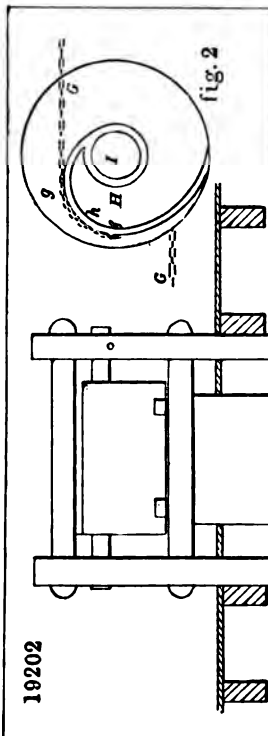
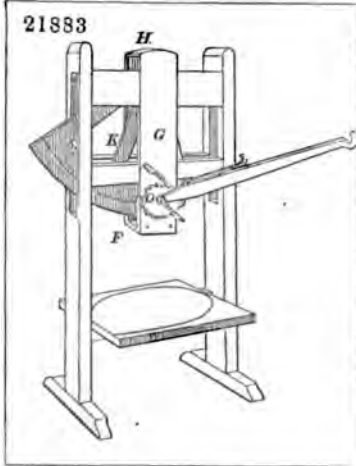


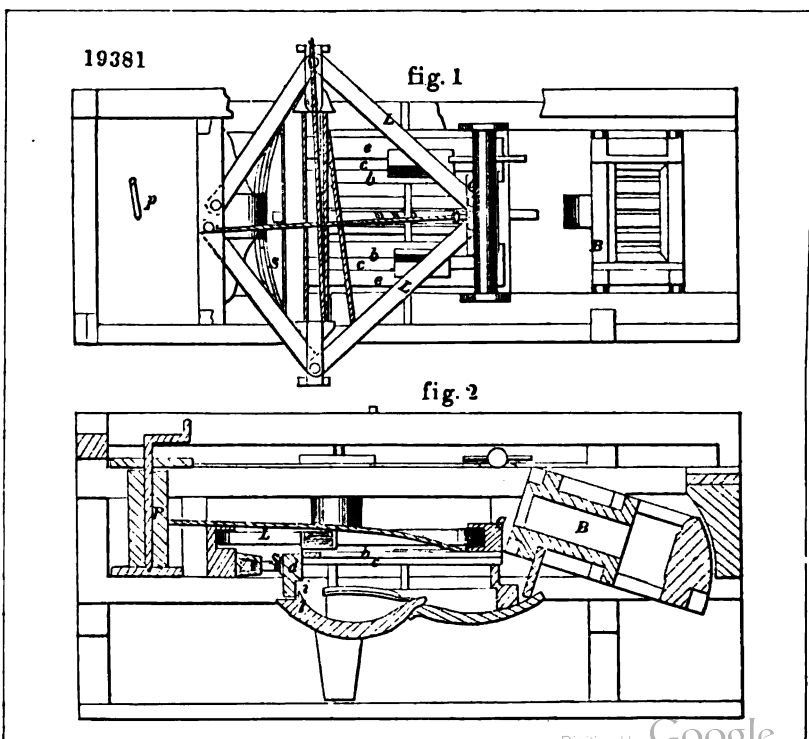
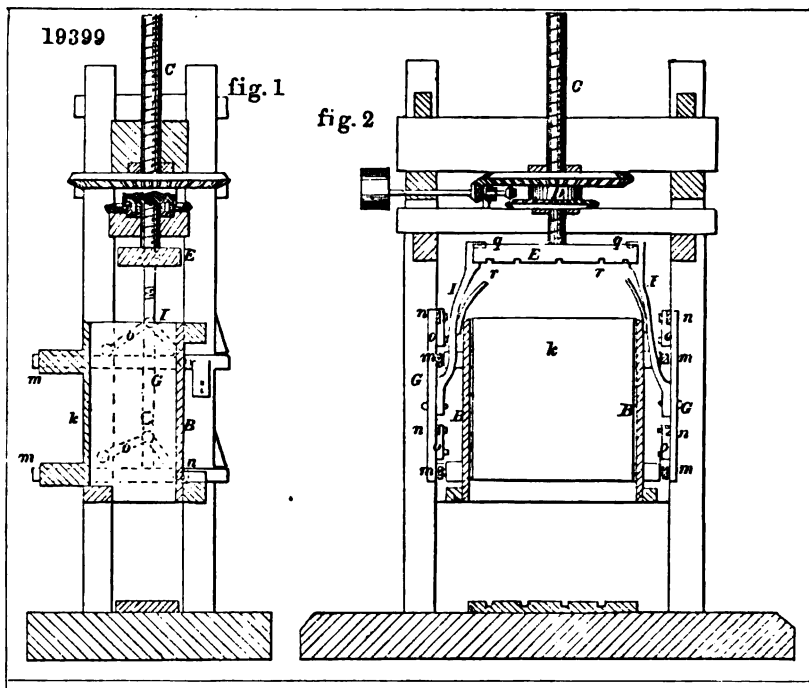
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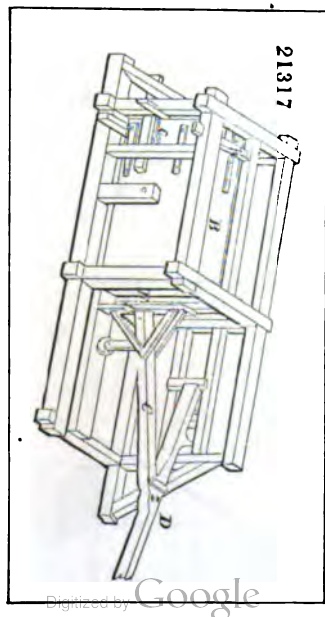
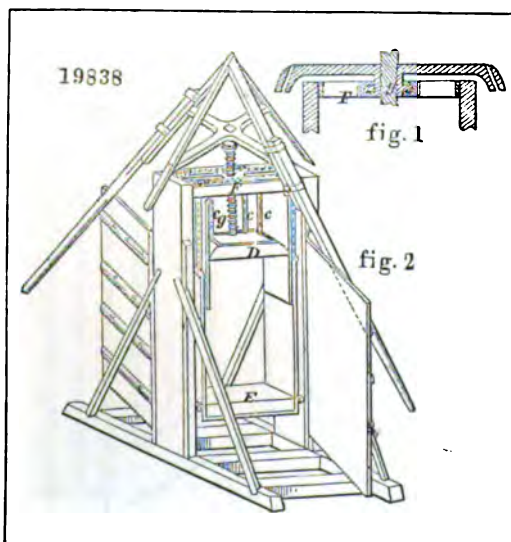
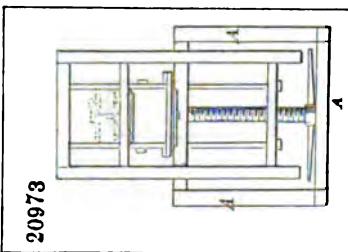
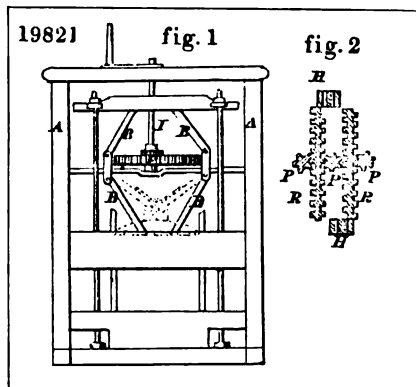
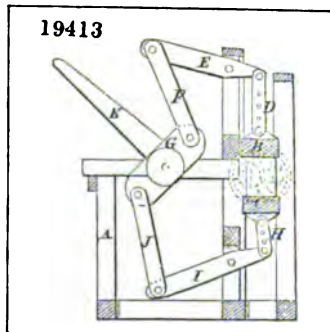
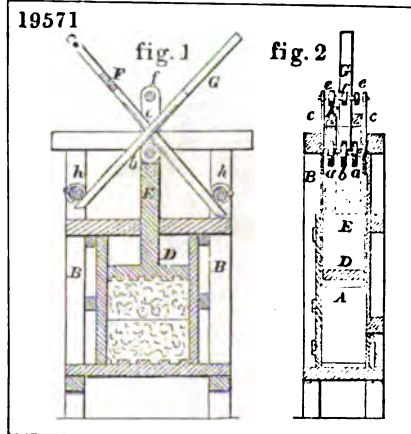
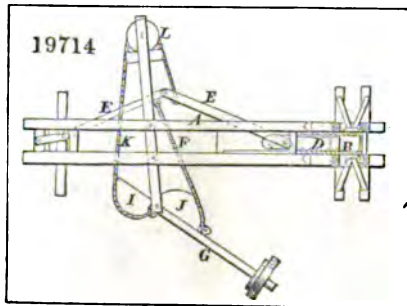


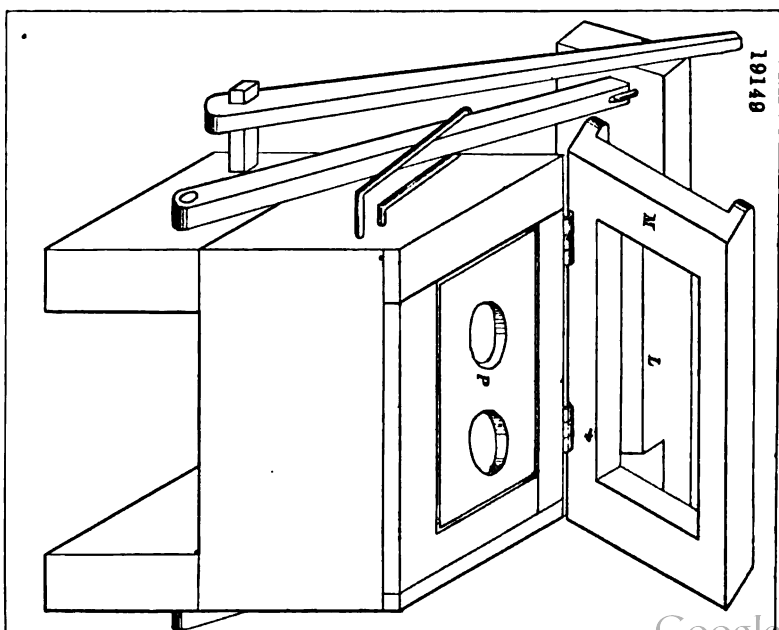
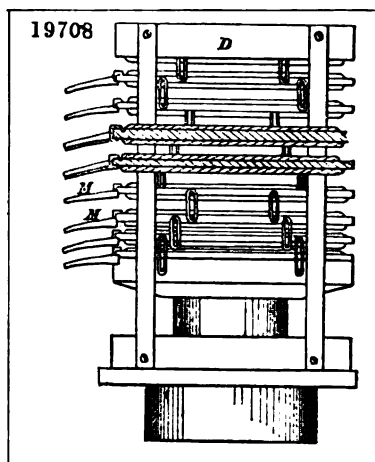
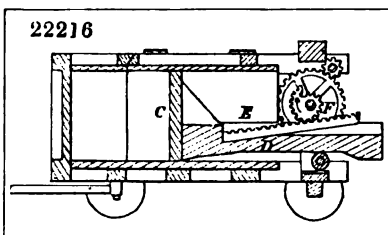
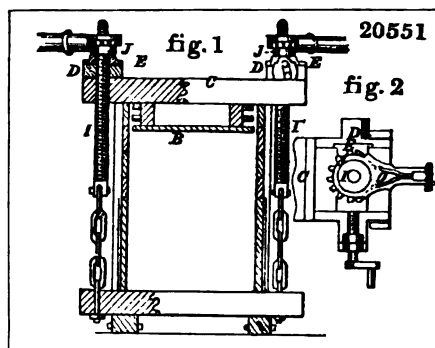
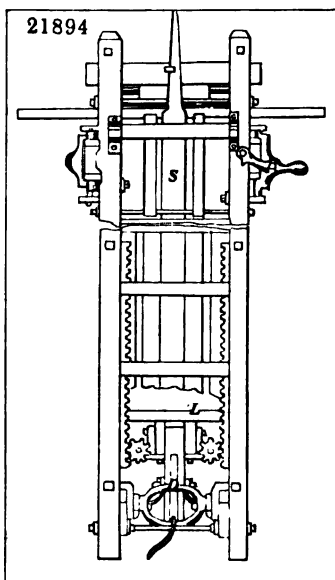


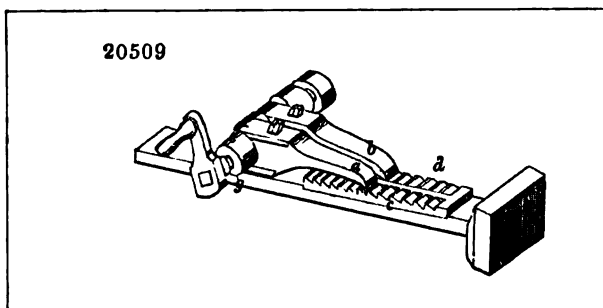
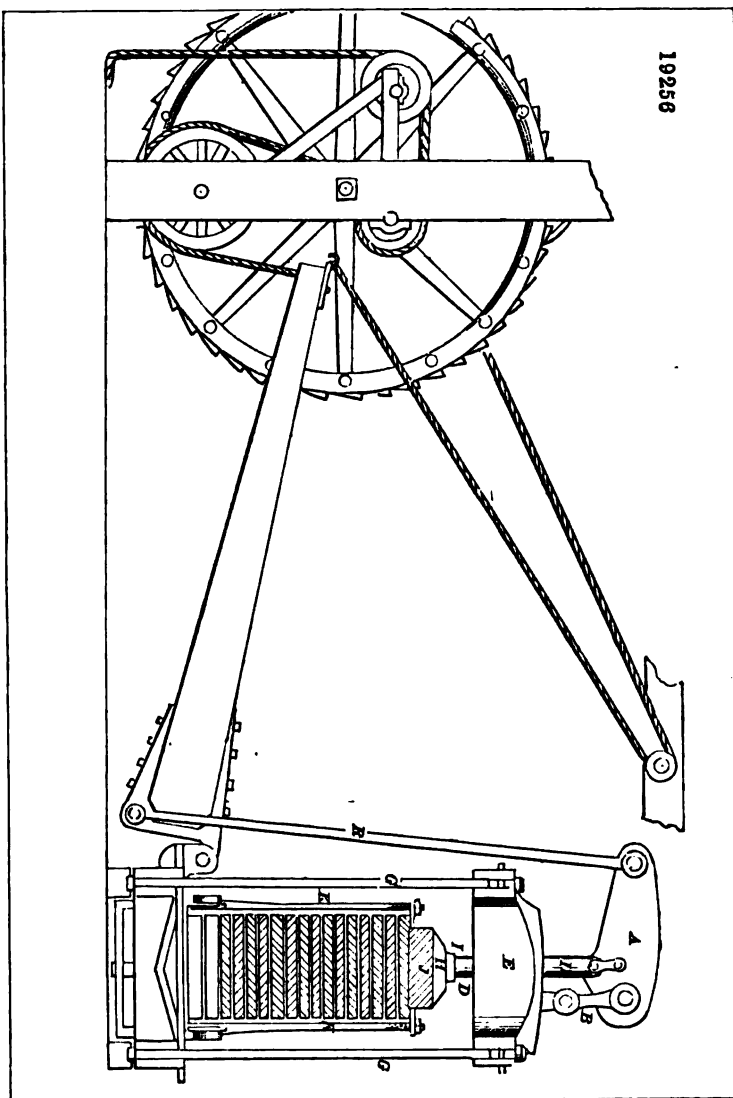






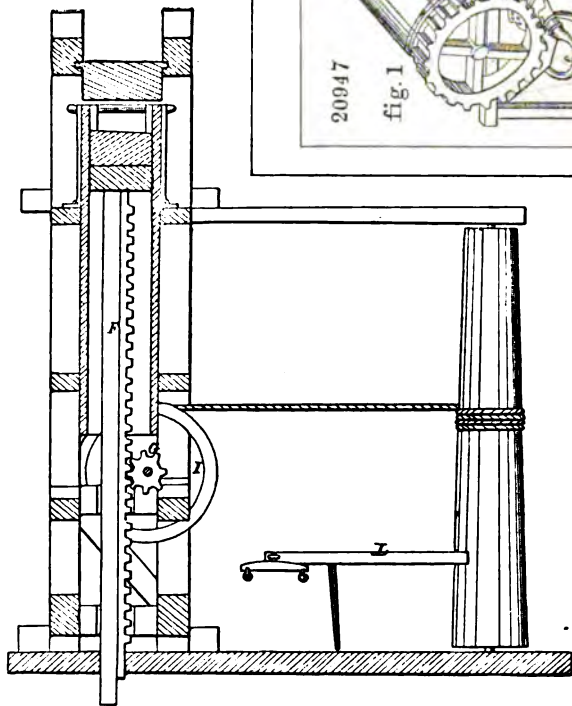






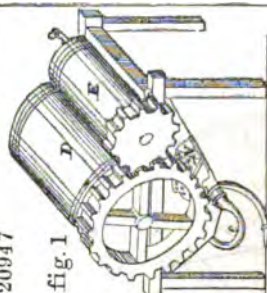


19232



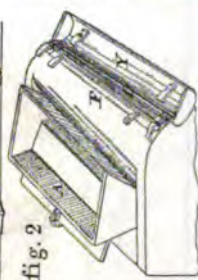
20947

fig. 1

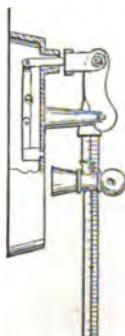


20947

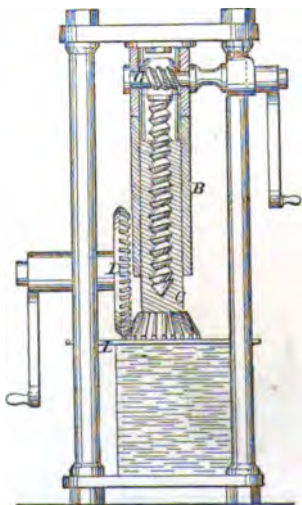
fig. 2



21145



21079



22014

fig. 1

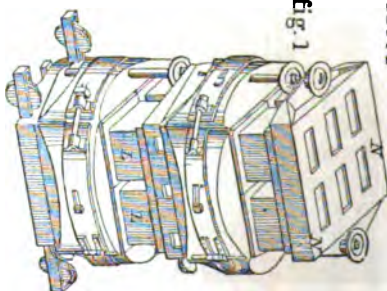
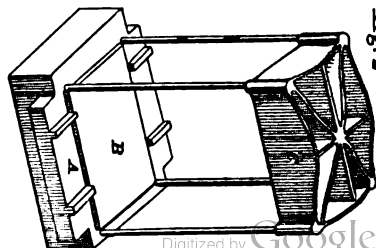
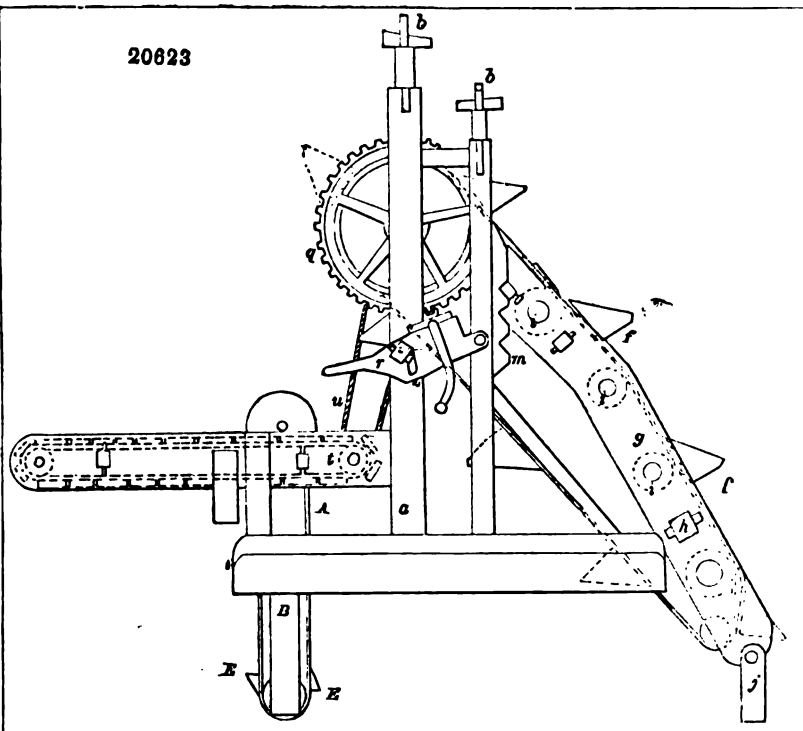


fig. 2



**20623**



20492

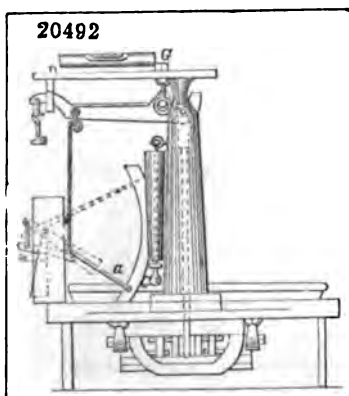
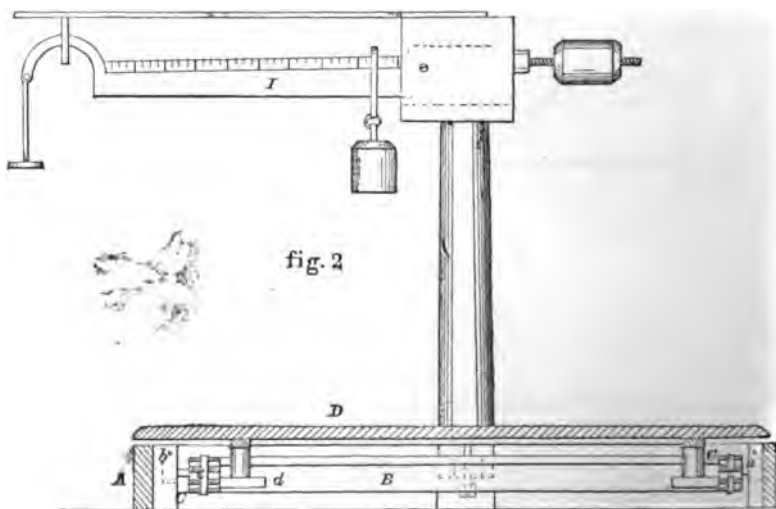
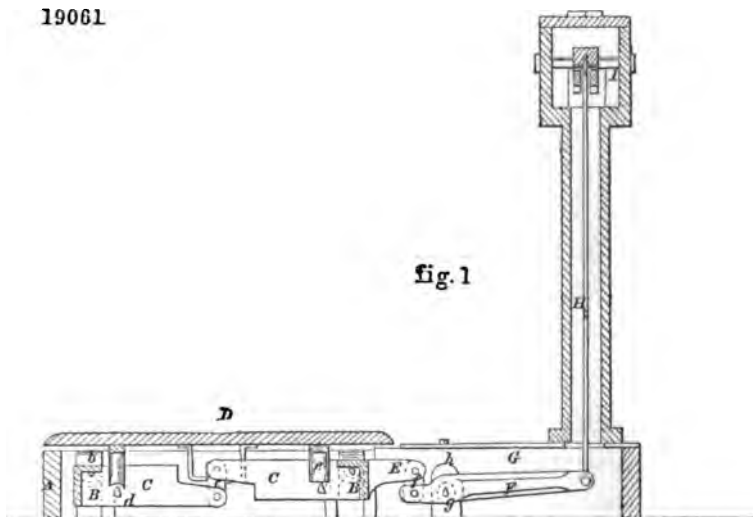


fig. 2

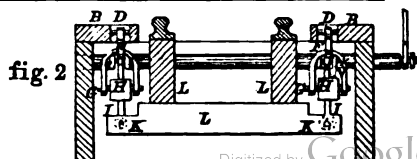
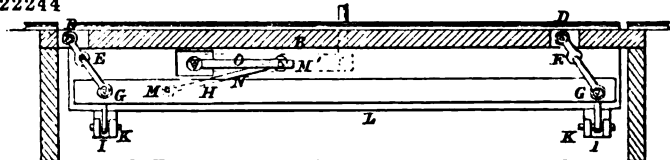
fig. 1'

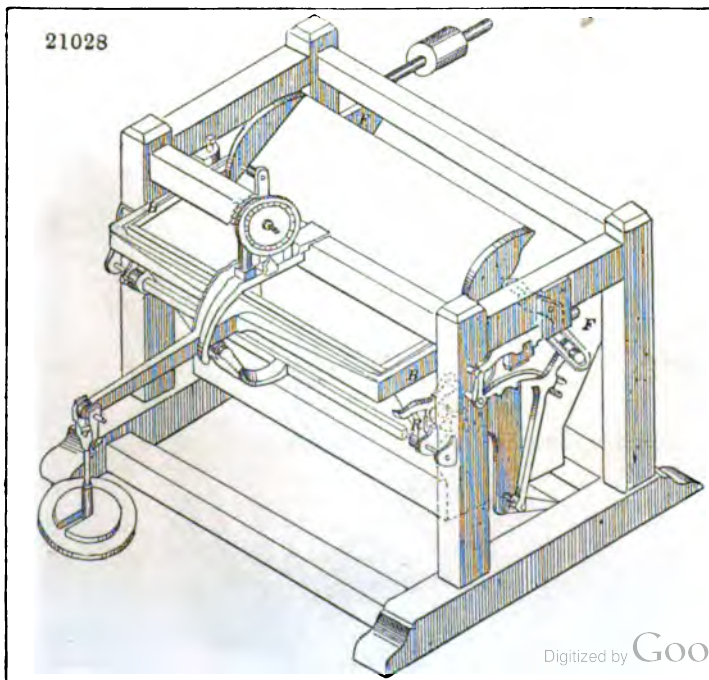
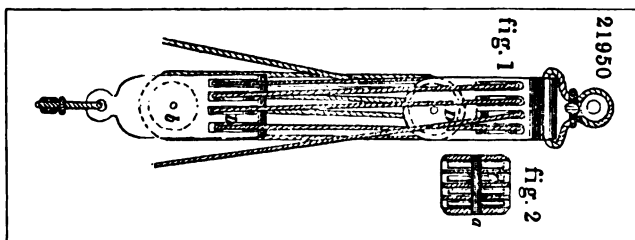
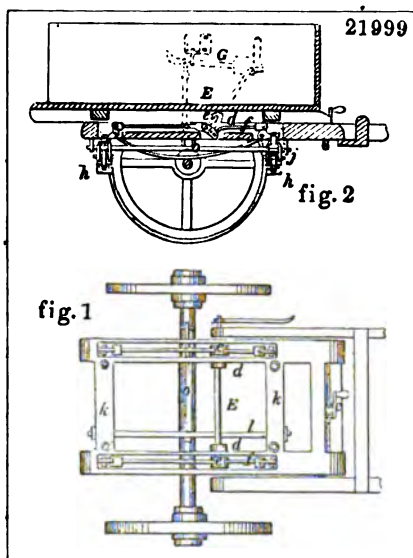
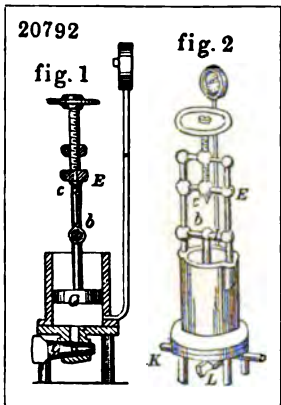
19985

19061



22244





20513

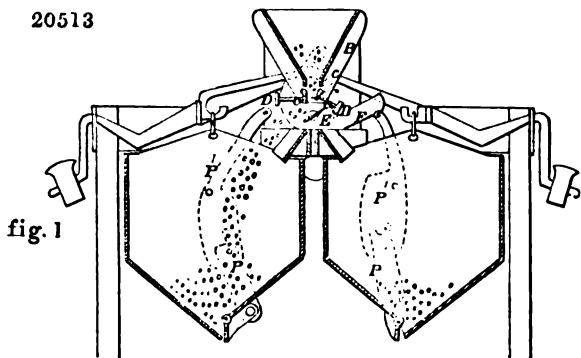
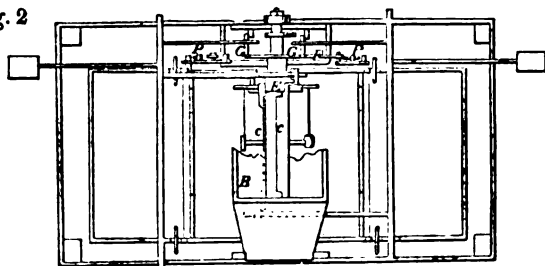


fig. 2



19460

fig. 1

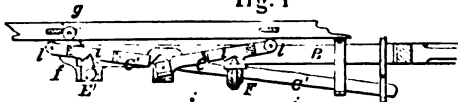


fig. 3

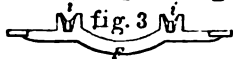
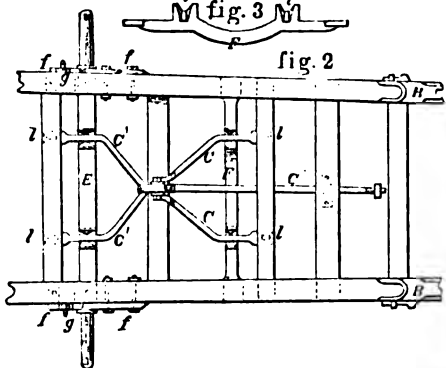
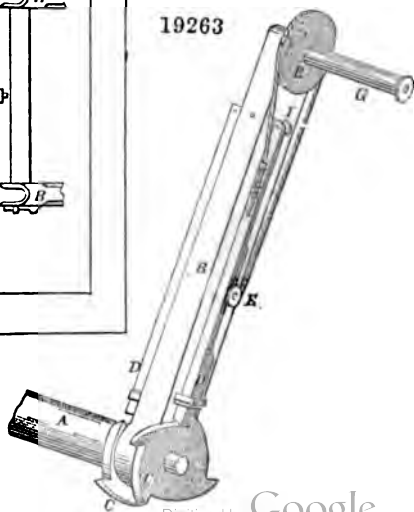


fig. 2



19263



19735

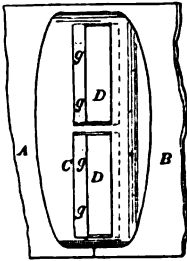


fig. 1



fig. 2

19318

fig. 2

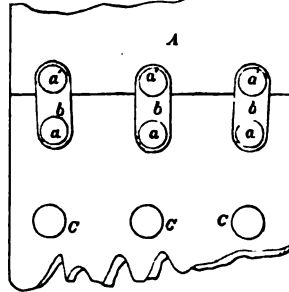
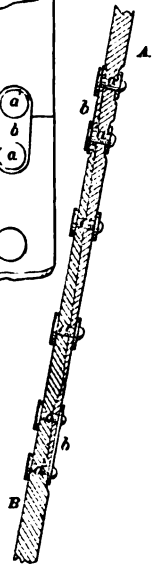
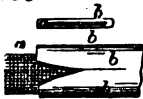


fig. 1



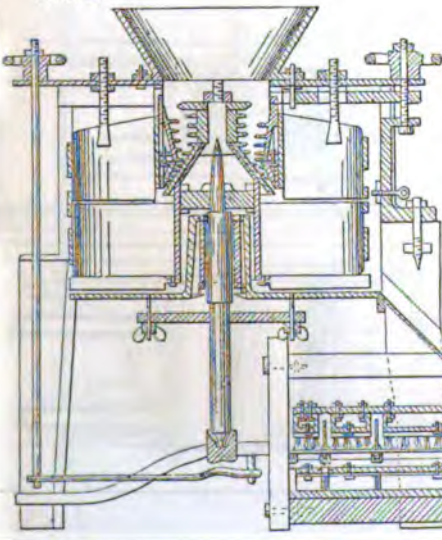
21596



20564



19892



19272

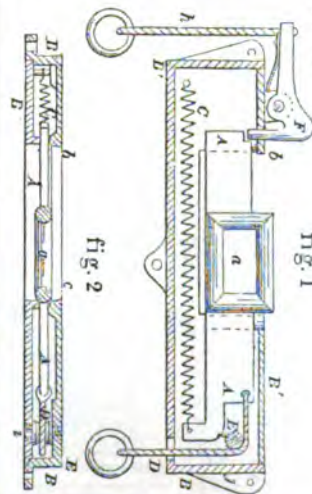
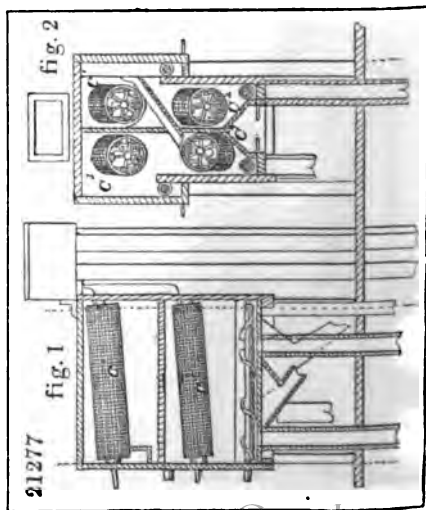
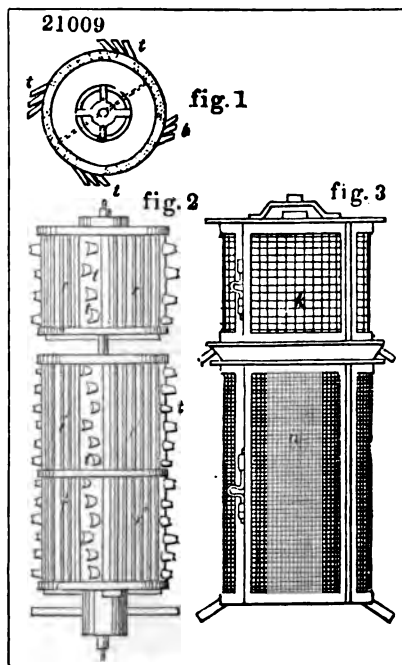
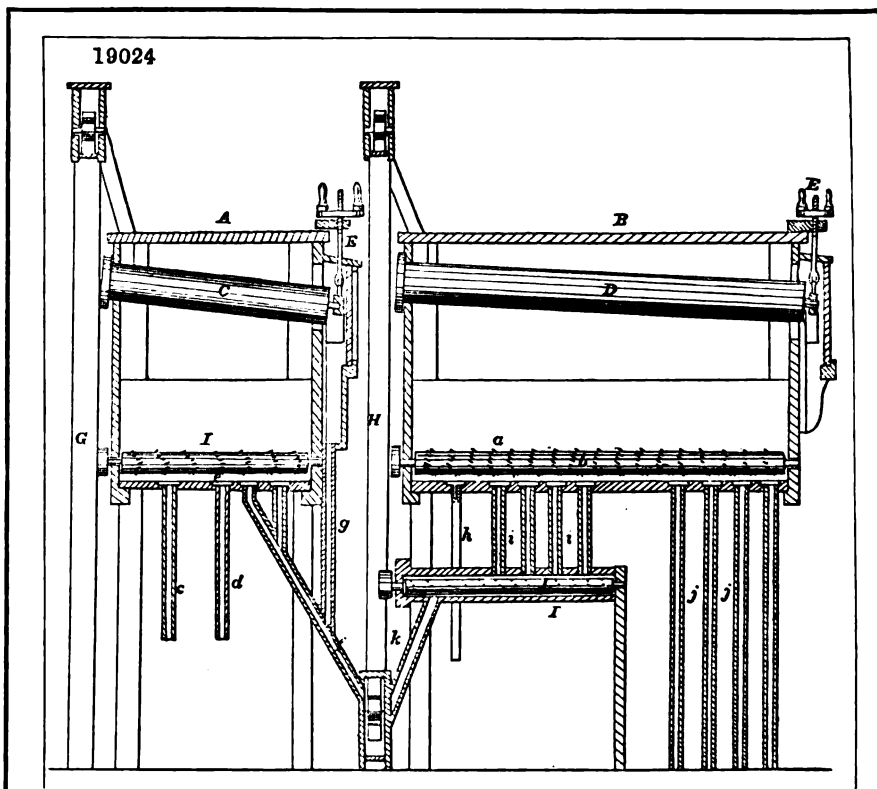


fig. 1

fig. 2

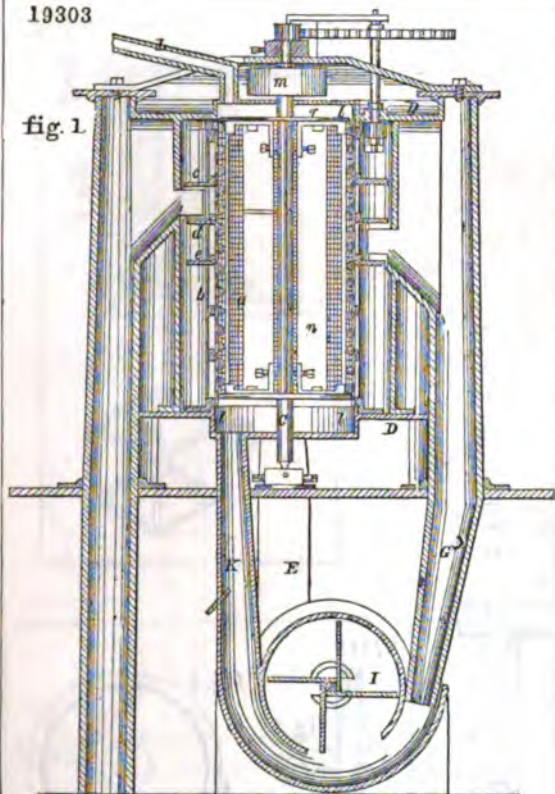




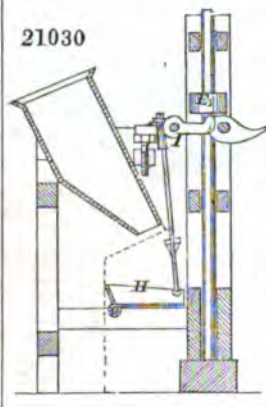


19303

fig. 1



21030



20601

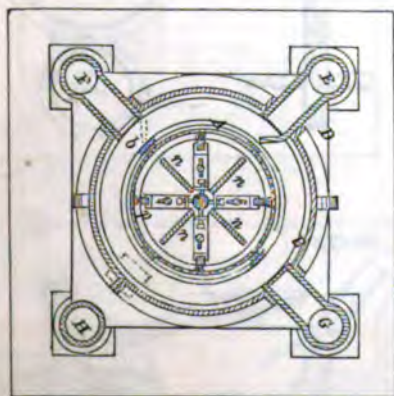
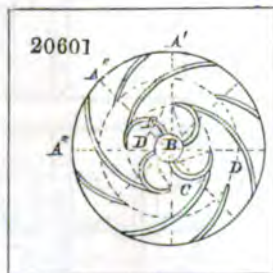


fig. 2

21061

fig. 1

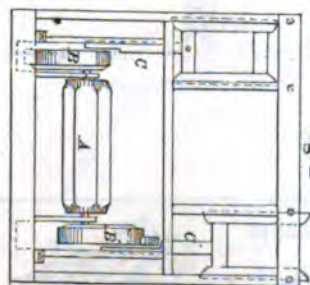


fig. 2

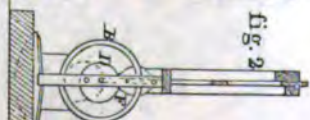
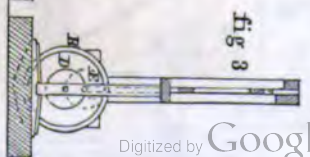
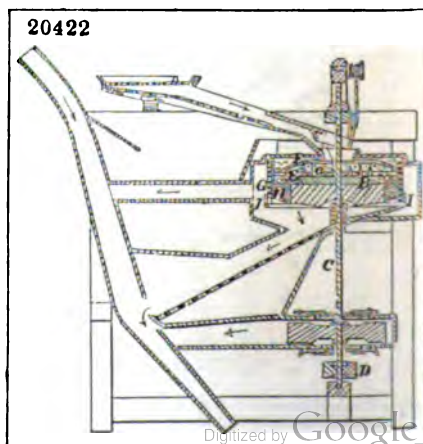
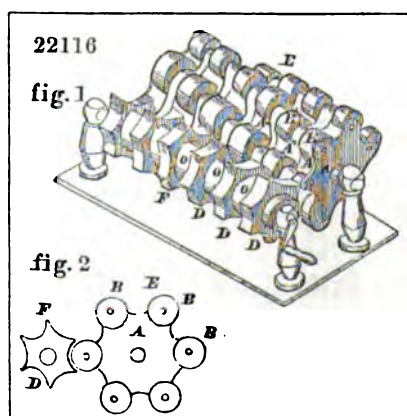
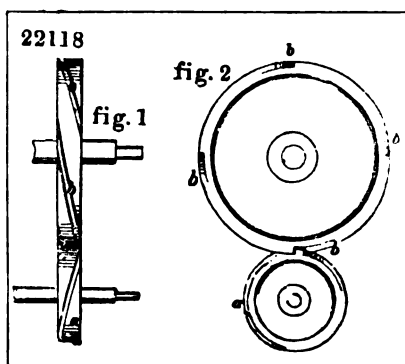
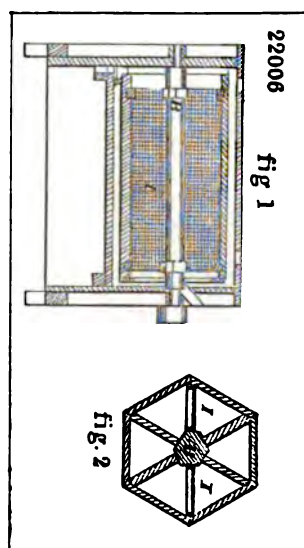
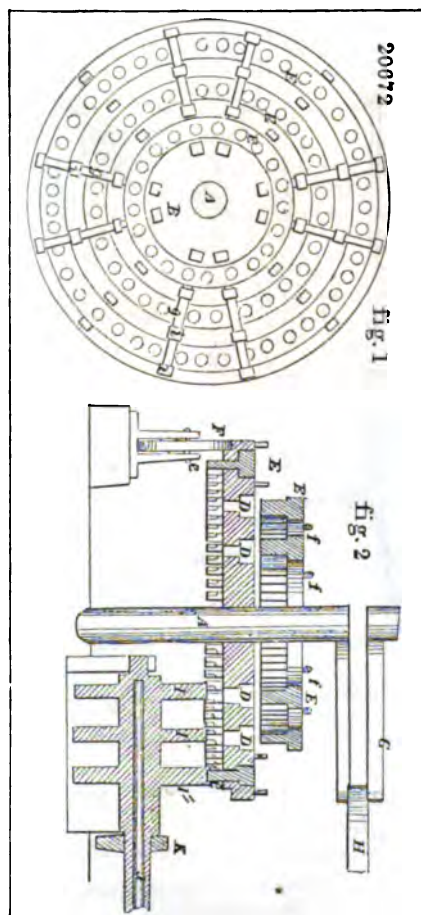
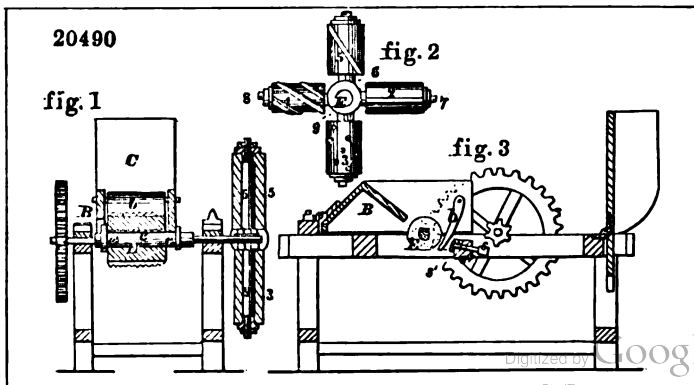
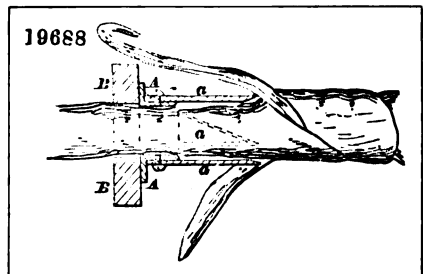
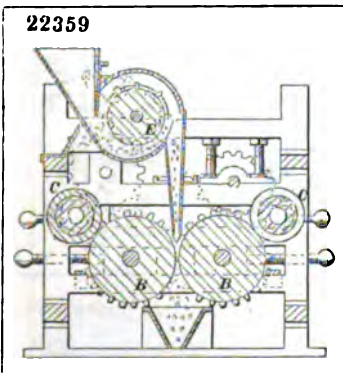
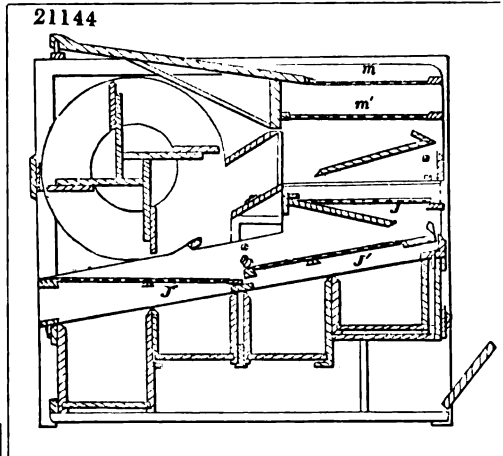
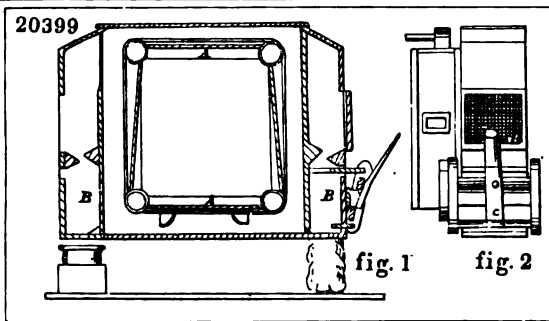
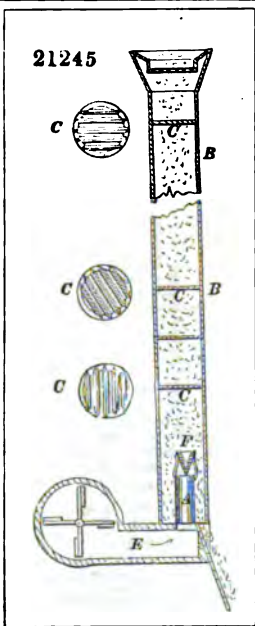


fig. 3



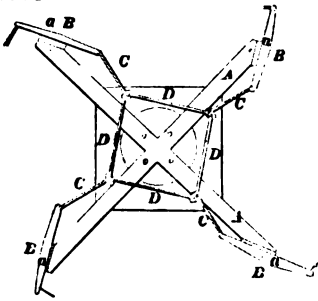




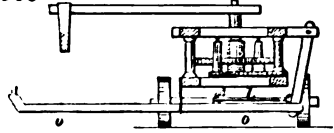




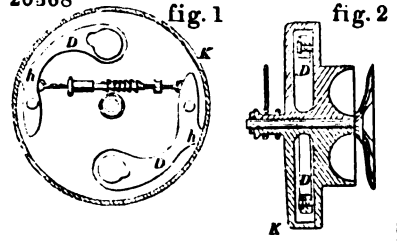
22079



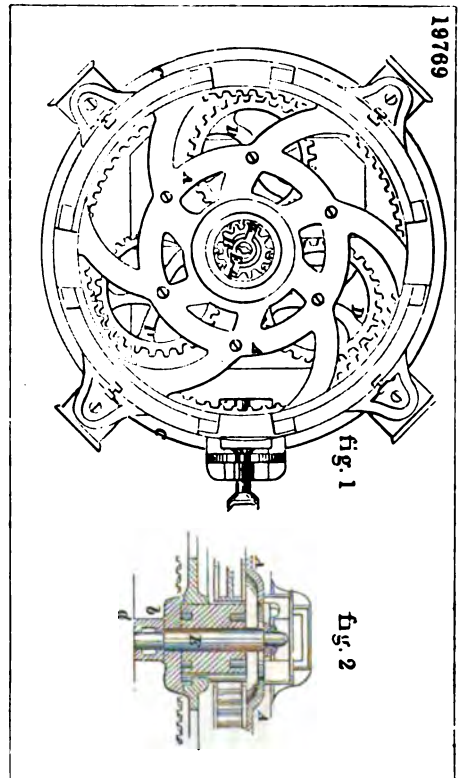
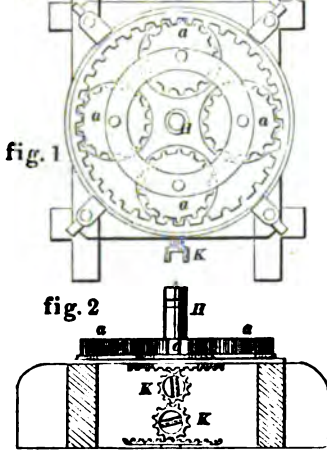
22360



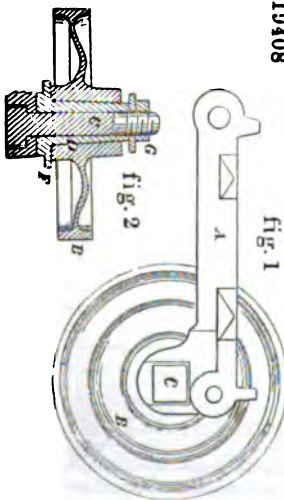
20368



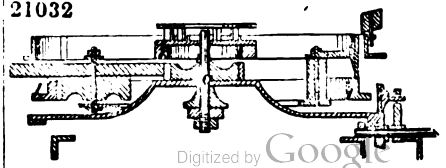
19976



19408



21032



22003

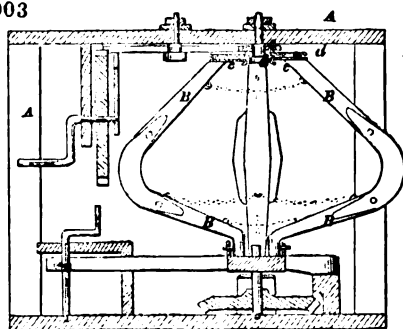


fig. 1

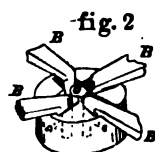


fig. 2

21474

fig. 1

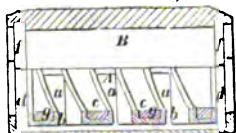
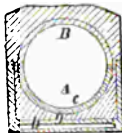
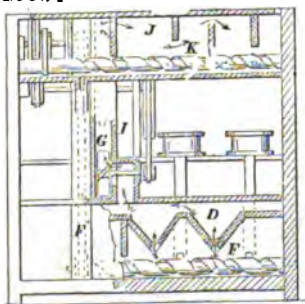


fig. 2



19984



19386

fig. 1

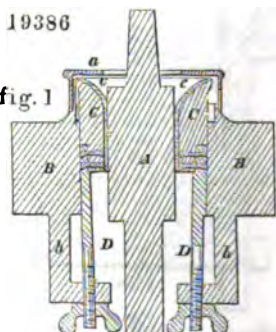
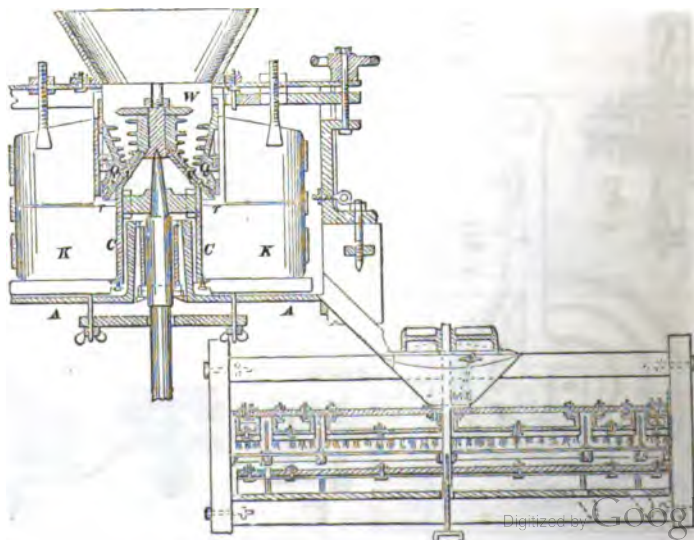


fig. 2

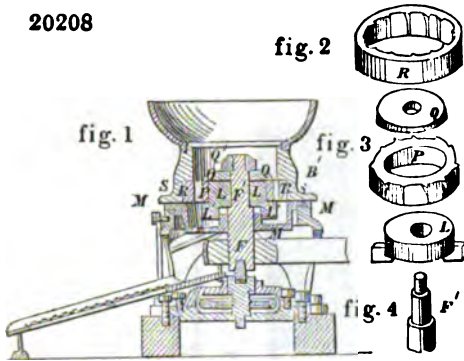


19807

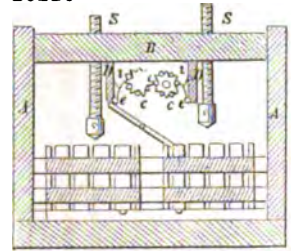




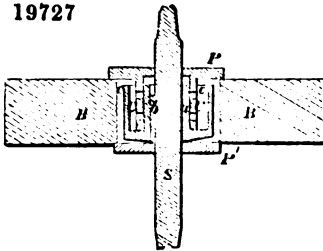
20208



20220



19727



21874

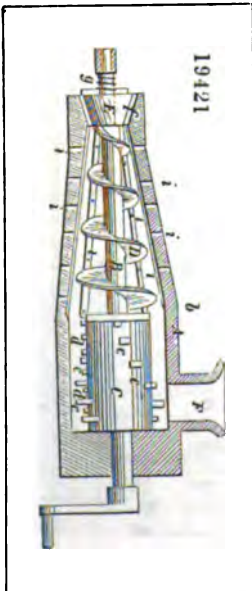
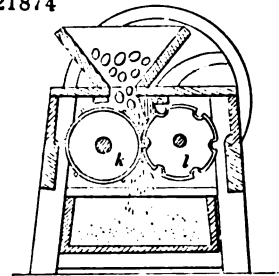
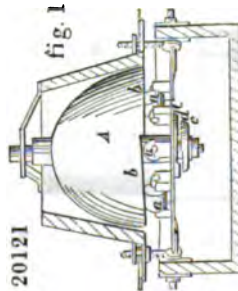
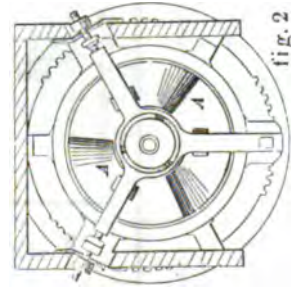


fig. 1



20121

fig. 2



20329

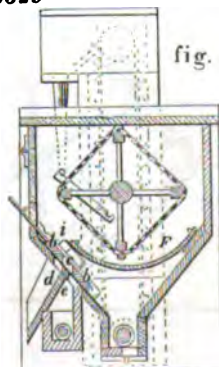
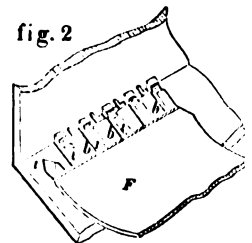
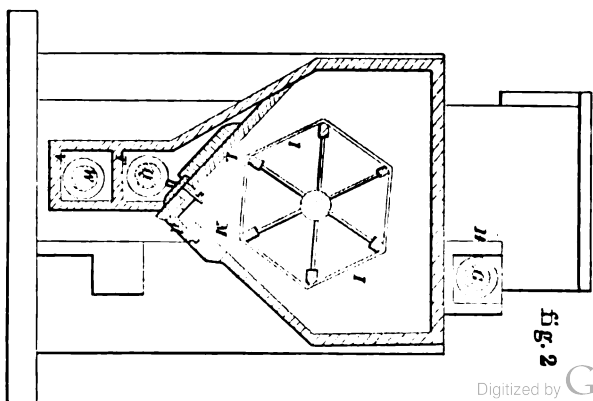
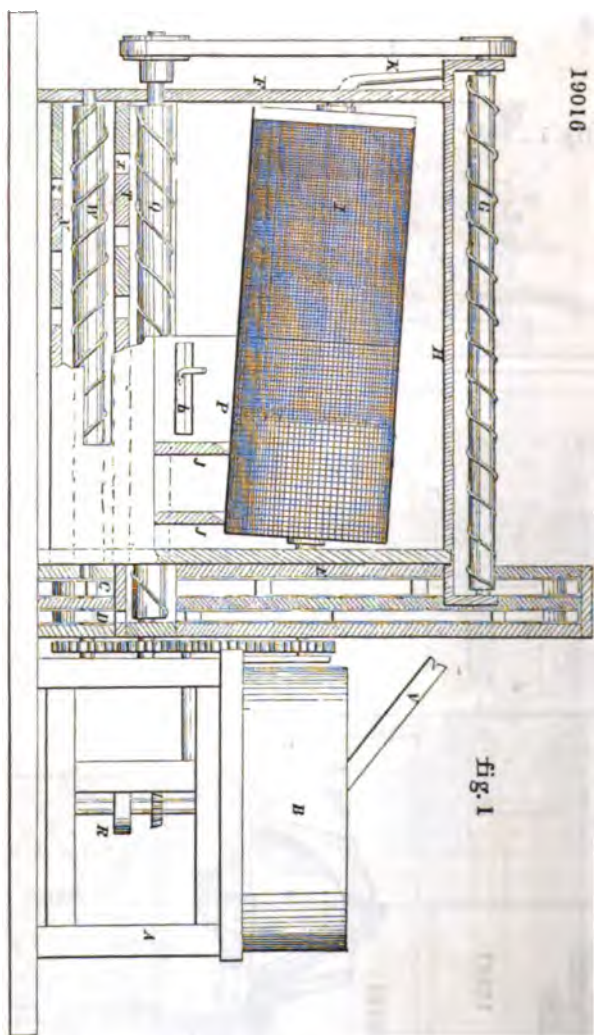


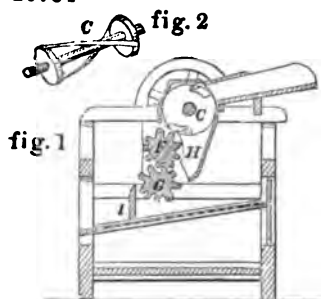
fig. 1

fig. 2

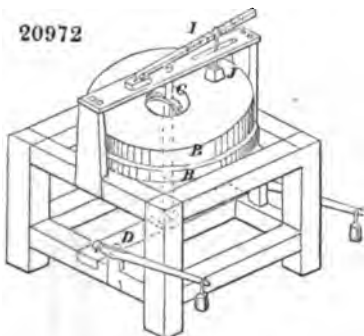




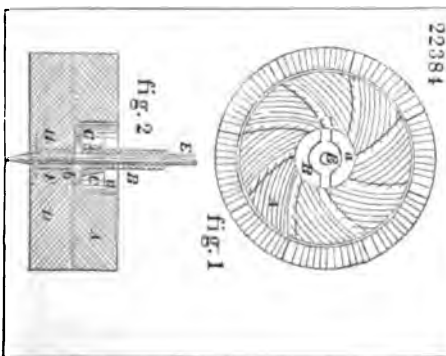
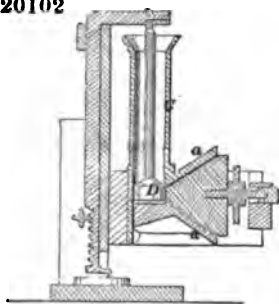
20784



20972



20102



22384

21062

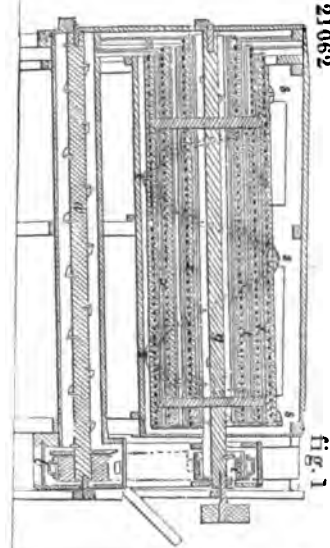


fig. 2

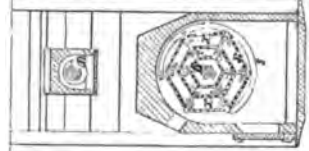
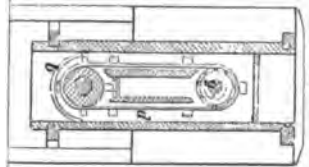
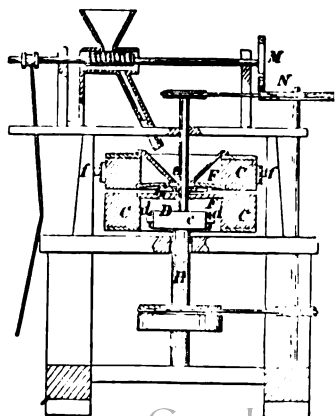


fig. 3



20370





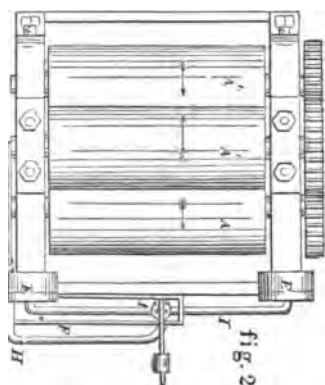


fig. 2

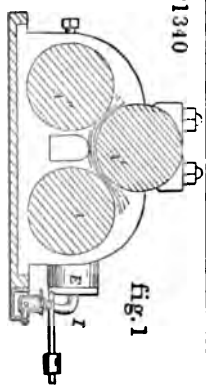


fig. 1

21340

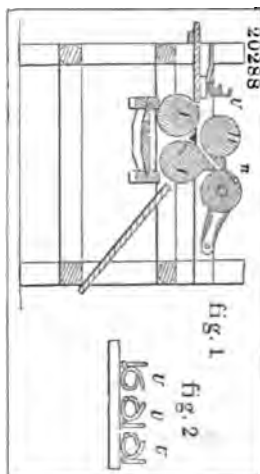


fig. 1

fig. 2

19251

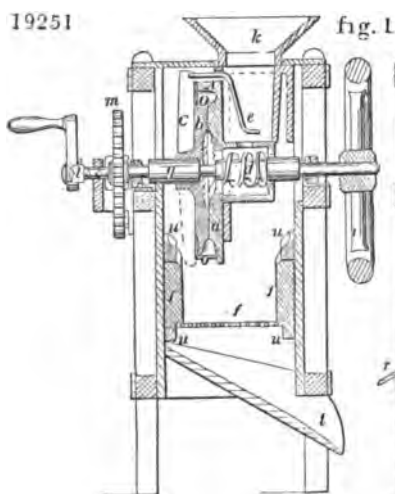


fig. 1

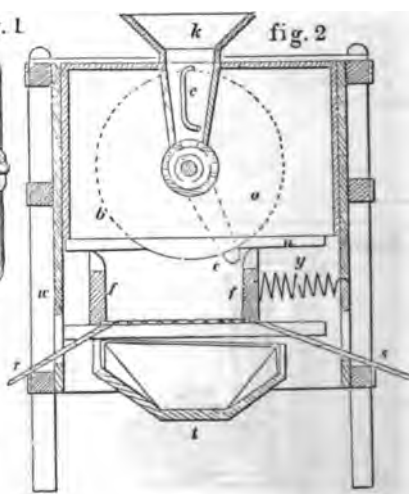


fig. 2

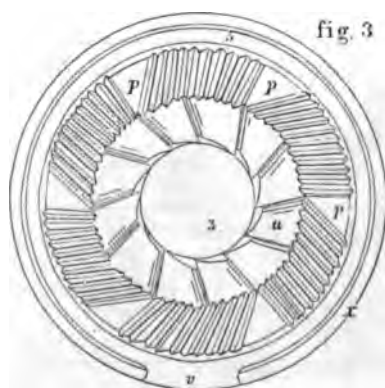


fig. 3

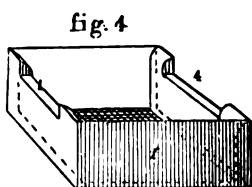


fig. 4

fig. 1

19093

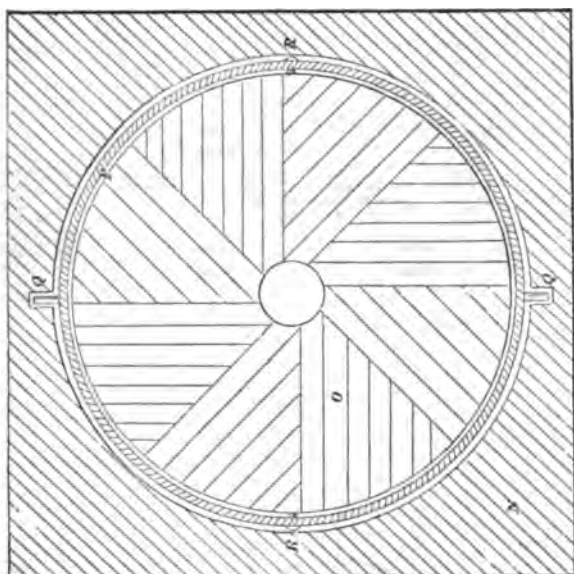


fig 2

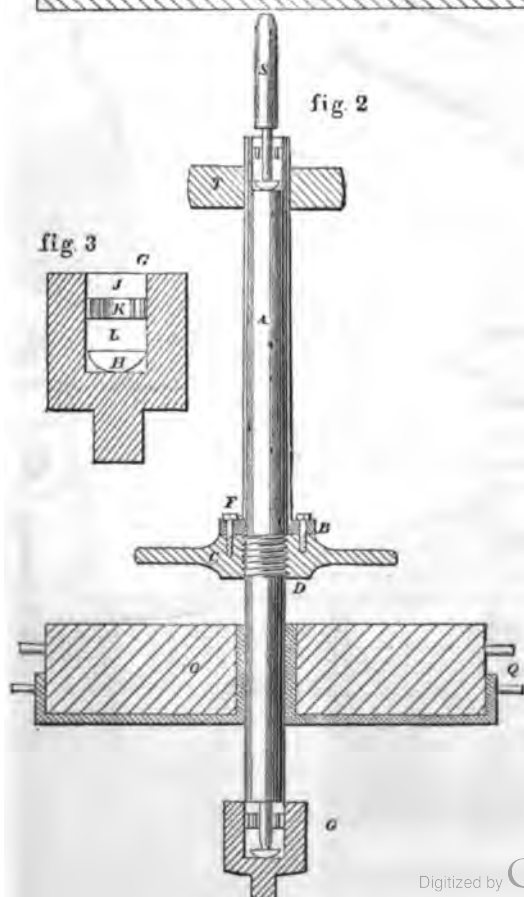
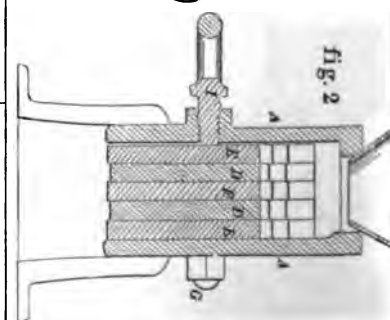
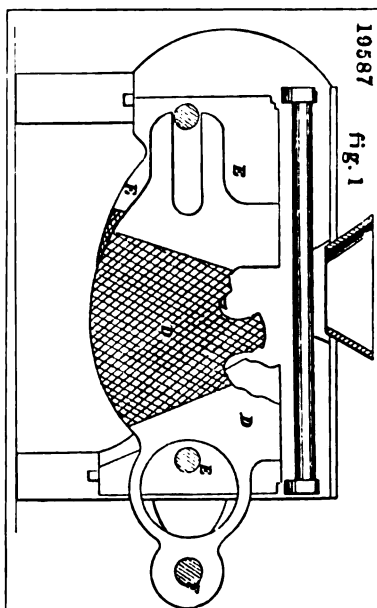
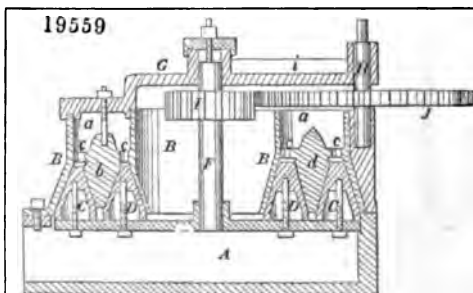
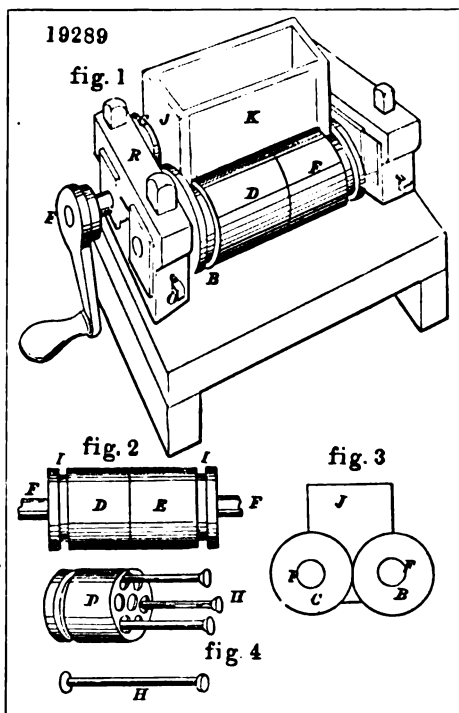
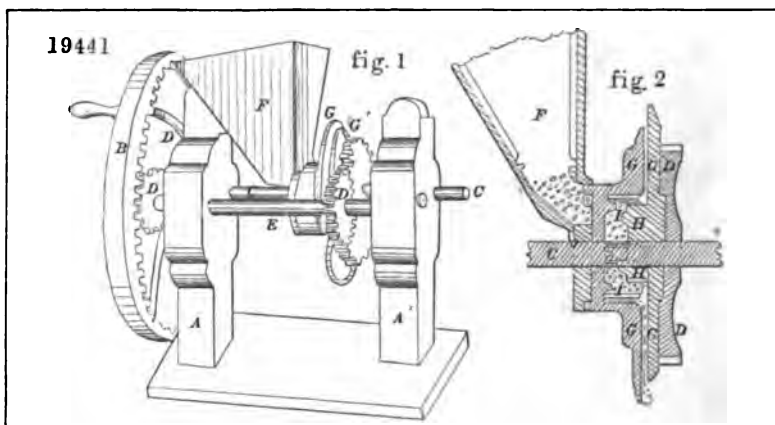
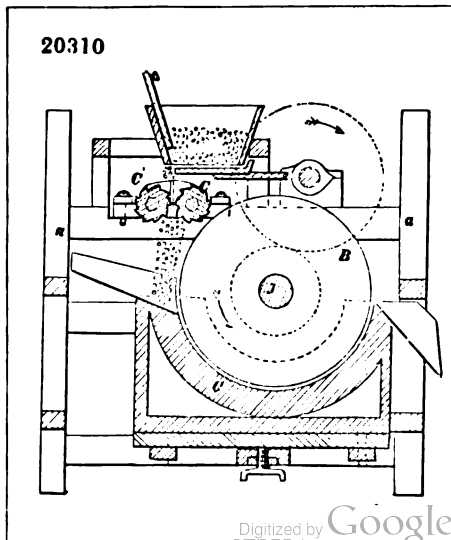
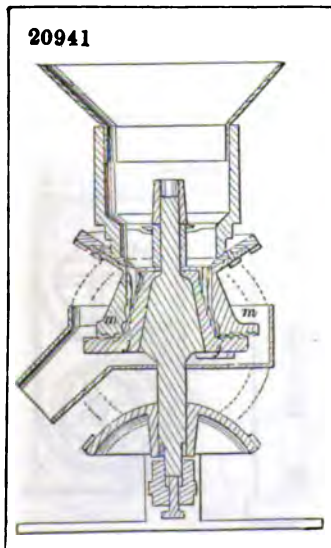
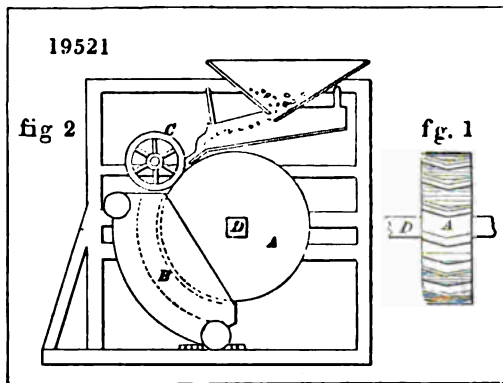
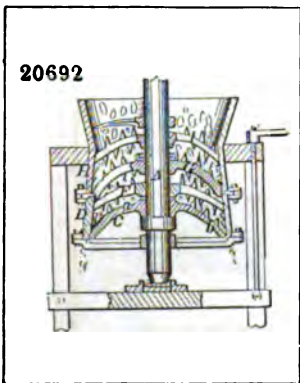
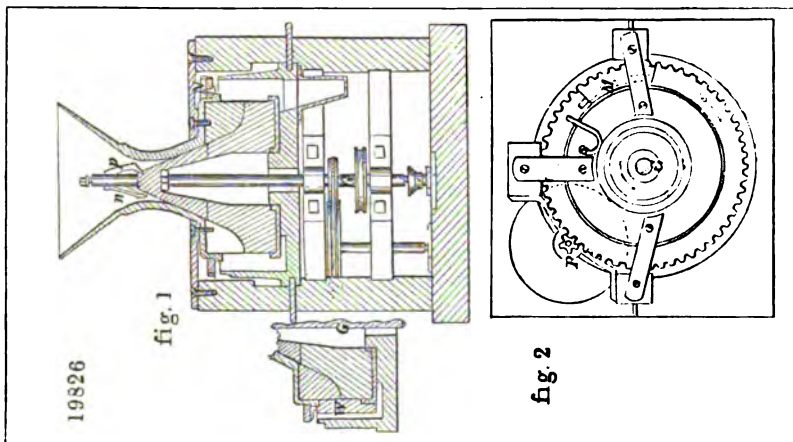


fig 3





19060

fig. 1

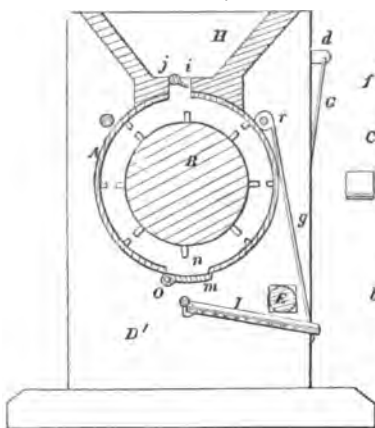


fig. 2

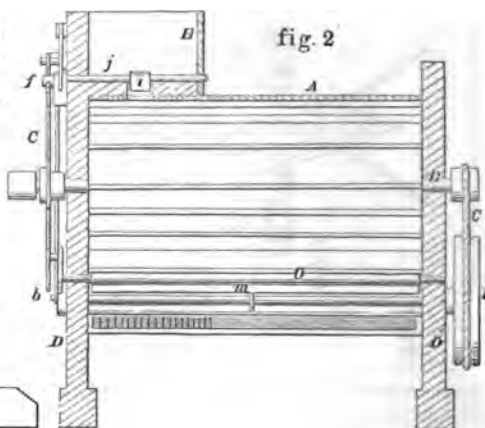
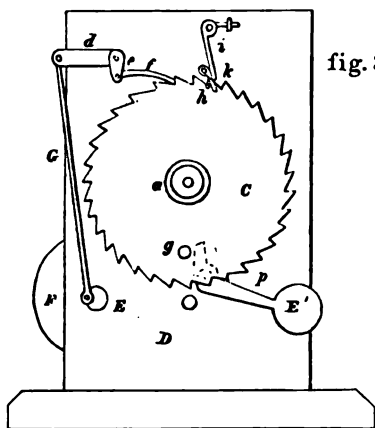
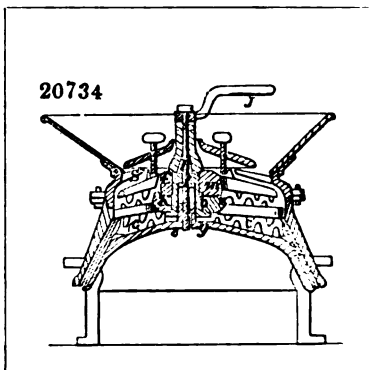


fig. 3



20734



20327

fig 1

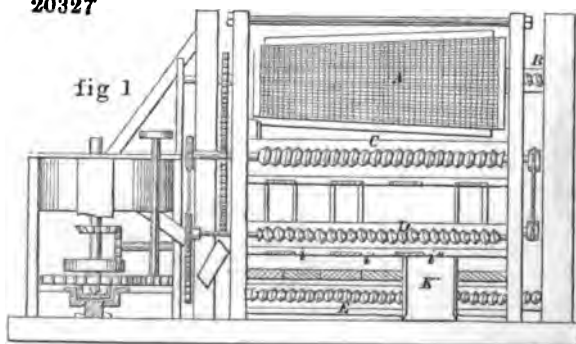
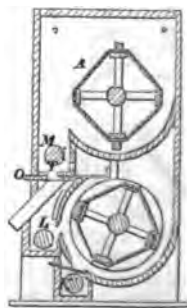


fig. 2



19297

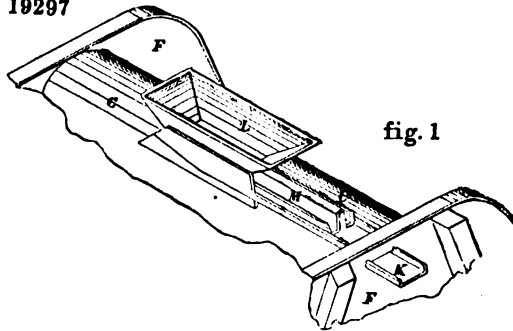


fig. 1

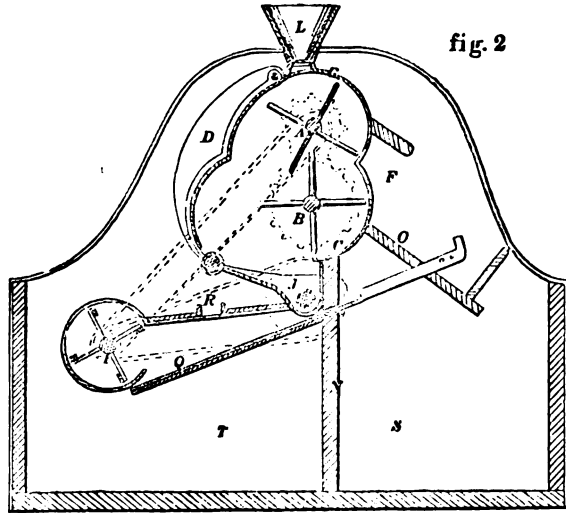


fig. 2

19691

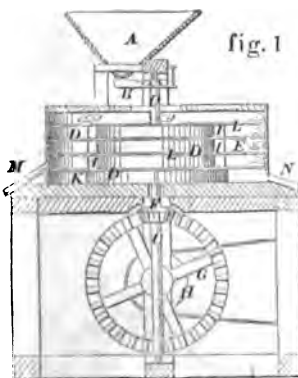


fig. 1



fig. 2

19696

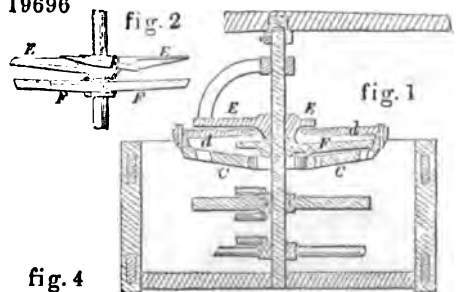


fig. 2

fig. 4

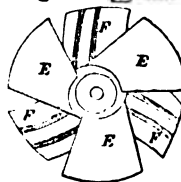
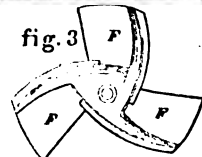
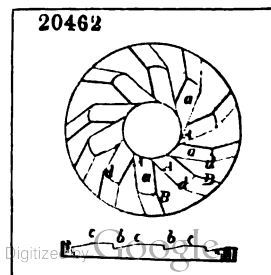
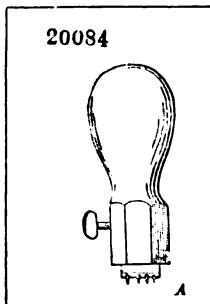
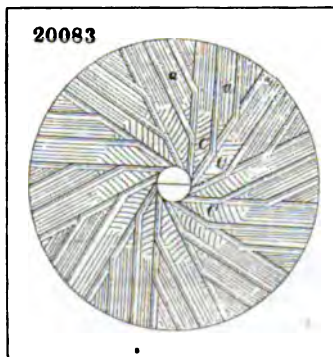
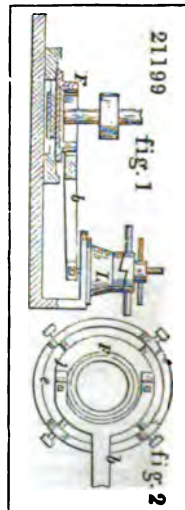
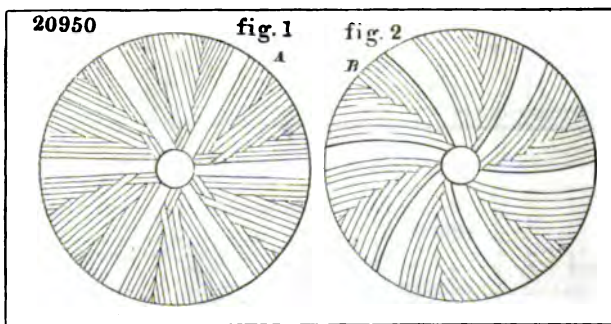
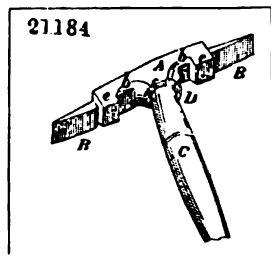
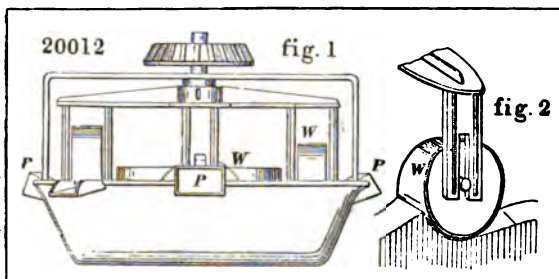
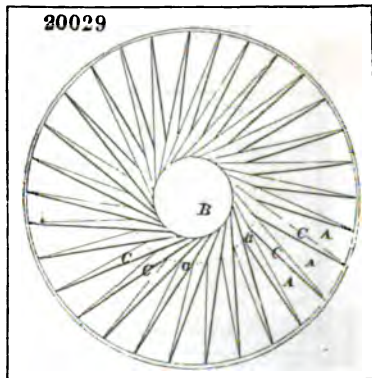
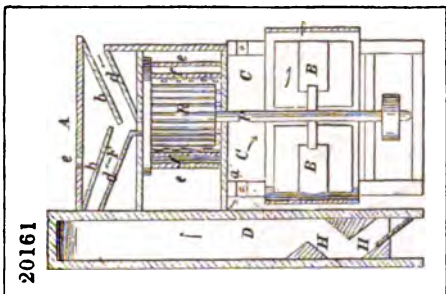


fig. 3

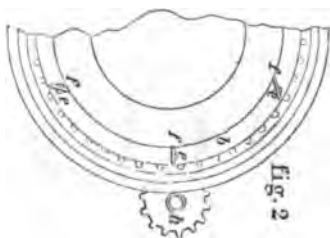
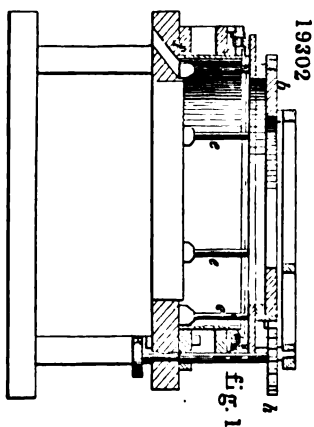




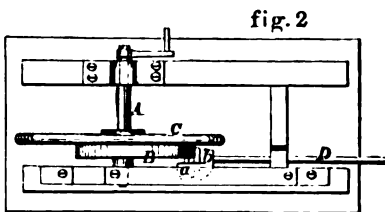
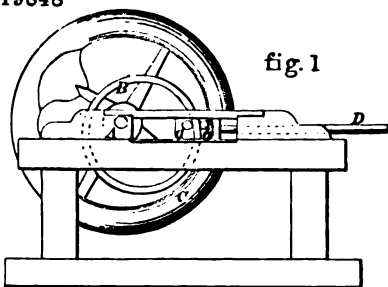




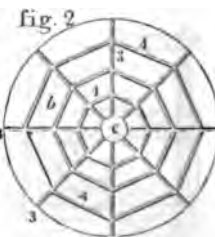
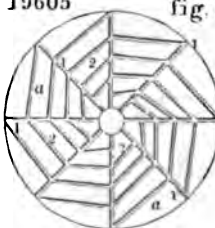




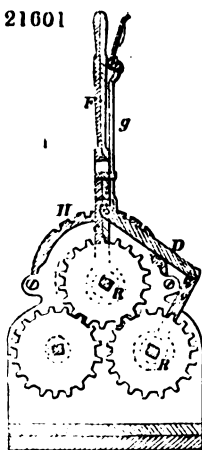
19848



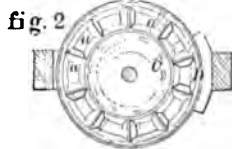
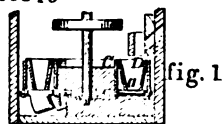
19605



21001



20540



20290

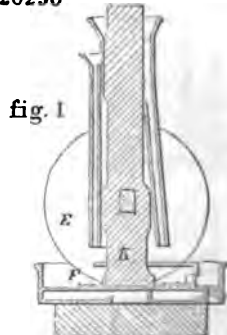
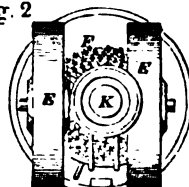
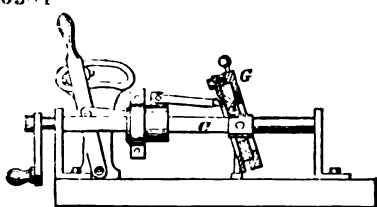


fig. 2



20381



21065

fig. 1

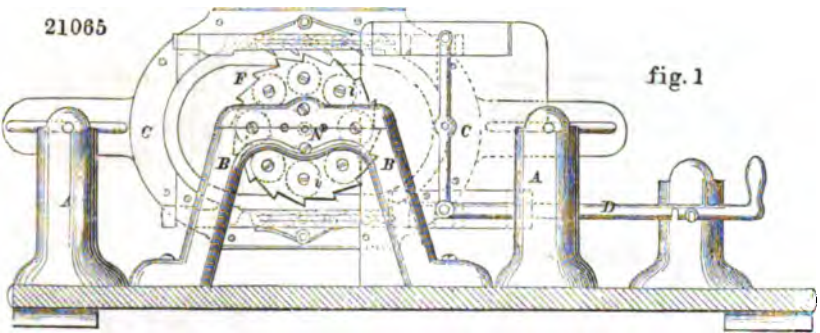
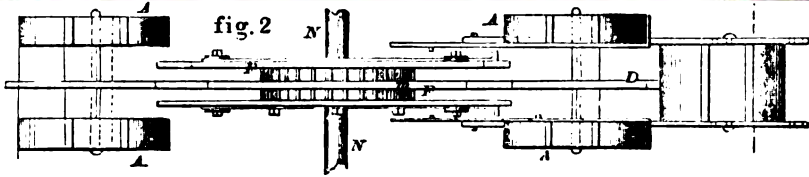
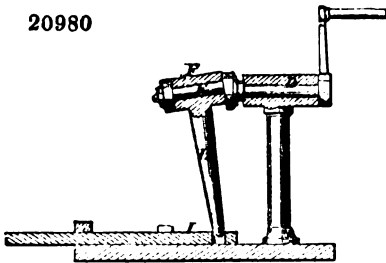


fig. 2



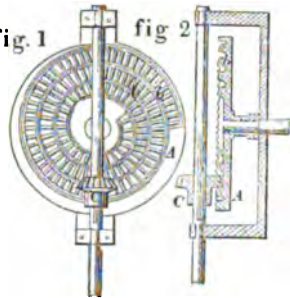
20980



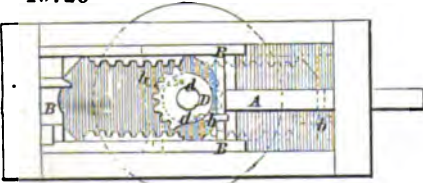
22445

fig. 1

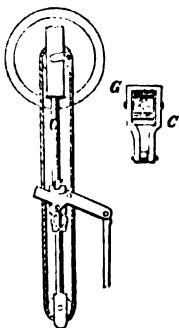
fig. 2



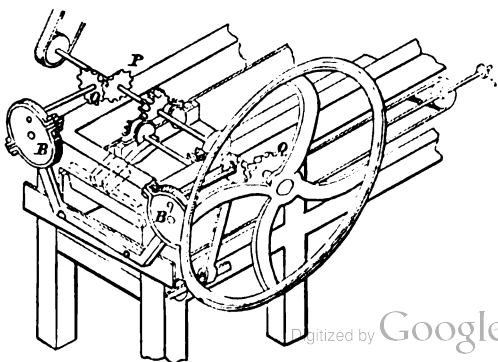
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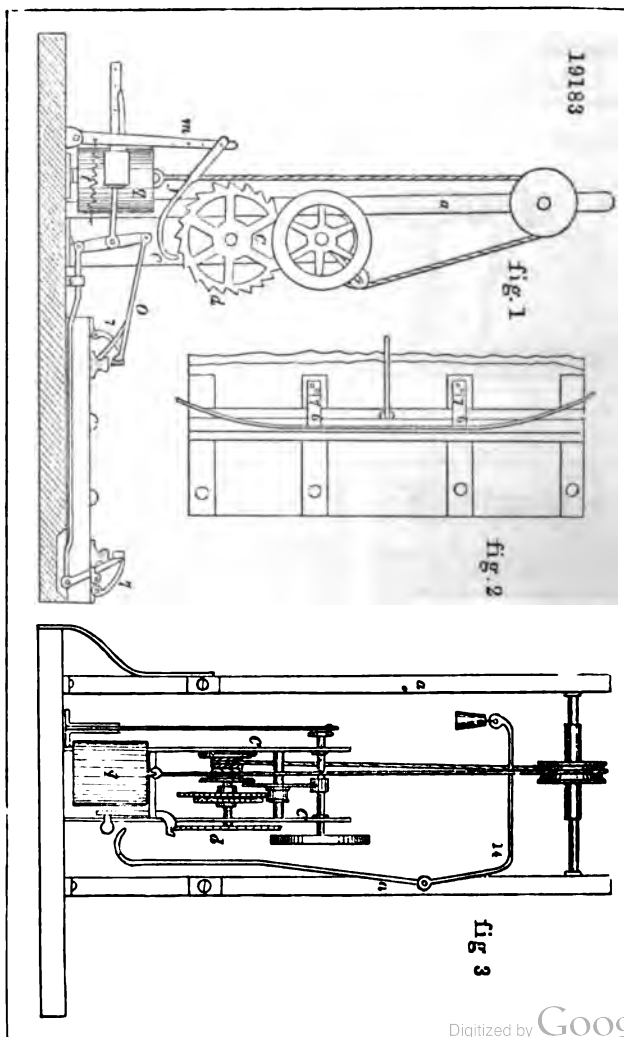
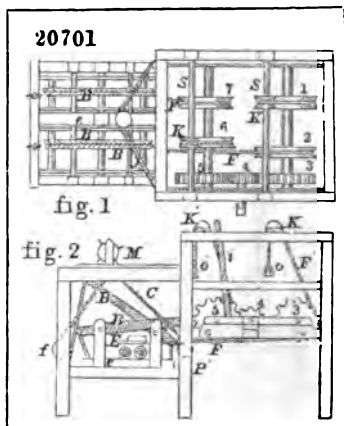
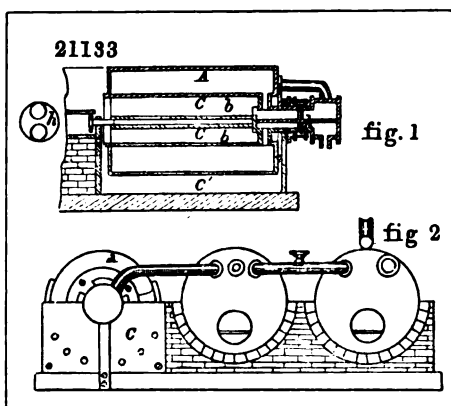


21934

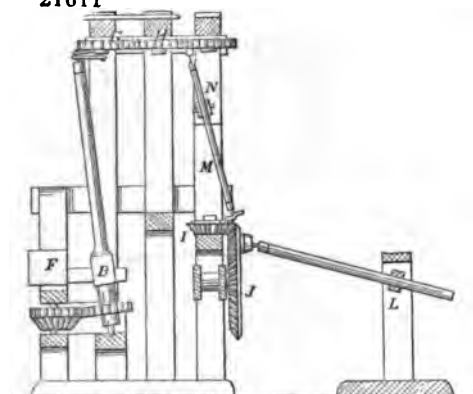


19586

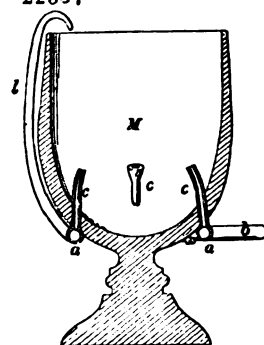




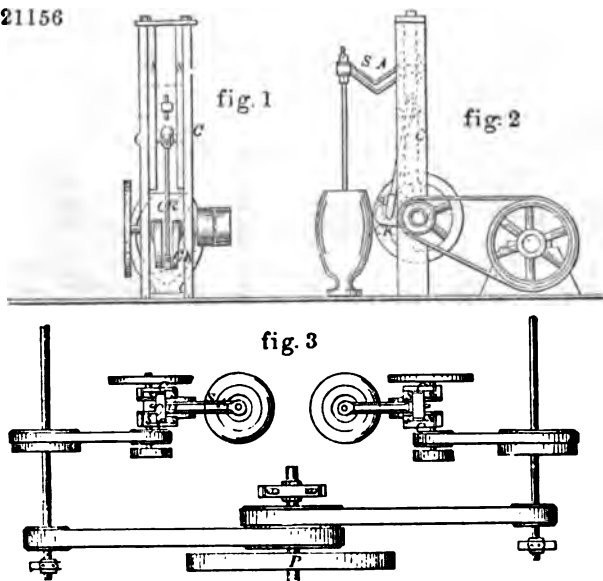
21611



22337



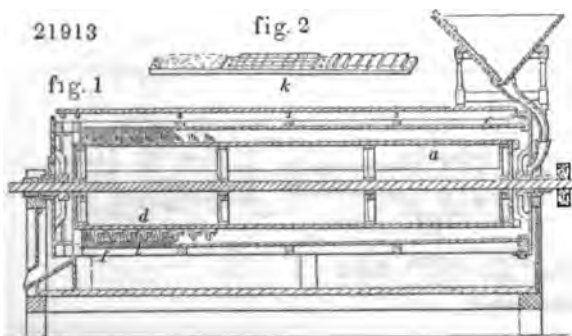
21156



21913

fig. 2

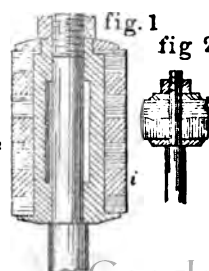
fig. 1

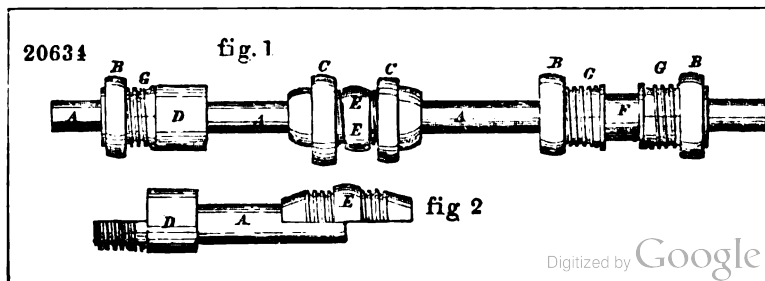
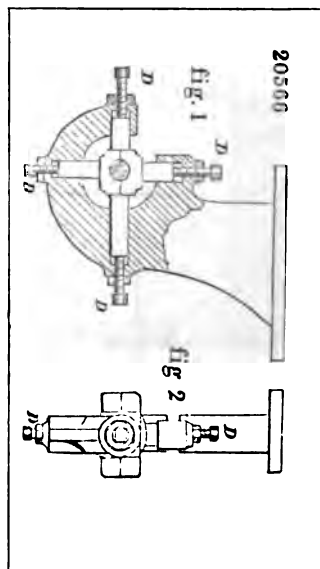
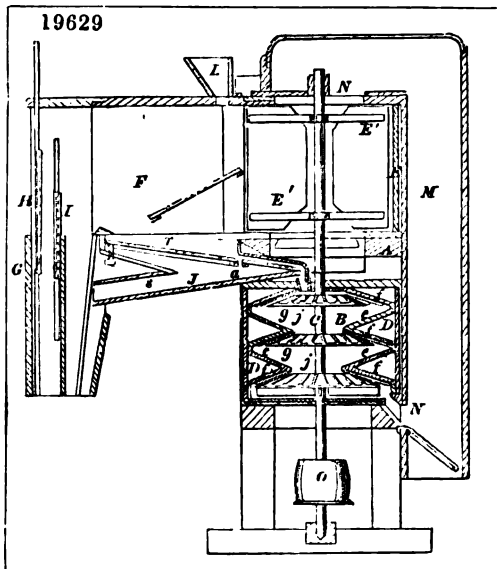
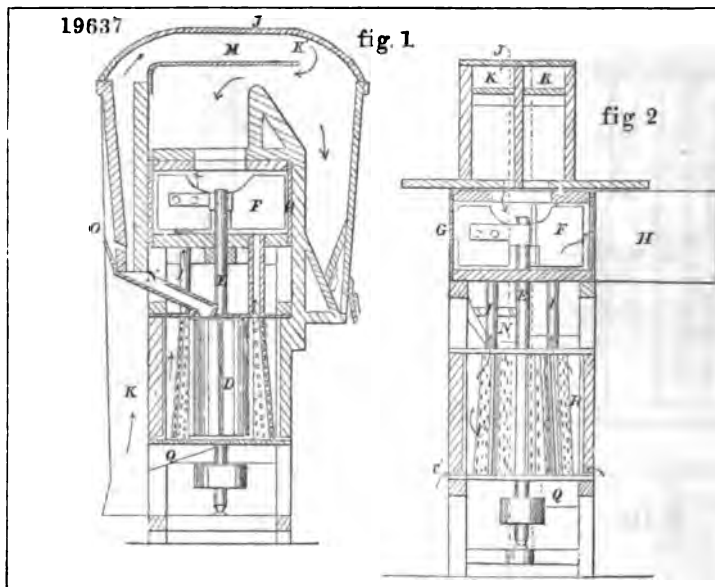


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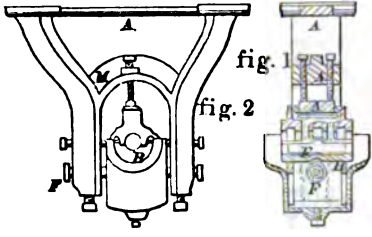
fig. 1

fig. 2



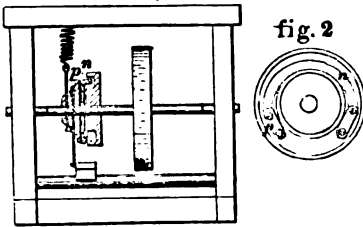


21640

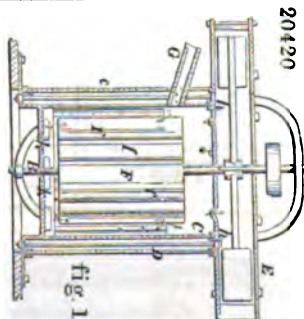
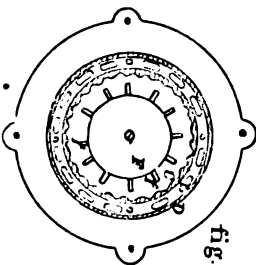
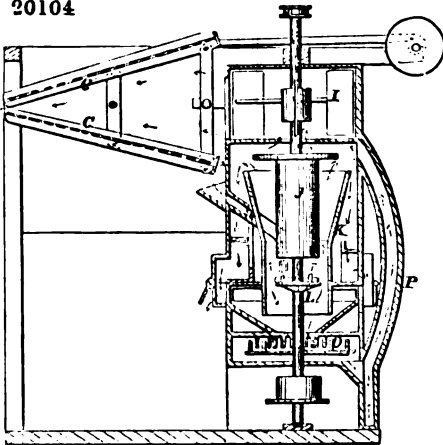


20800

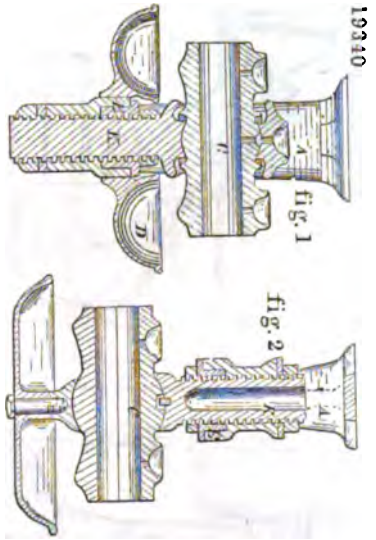
fig. 1



20104

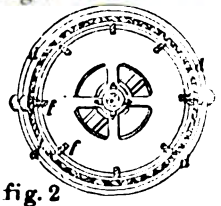
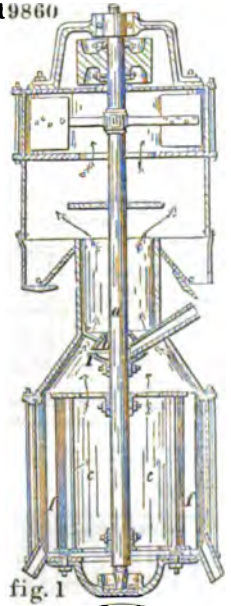


20420



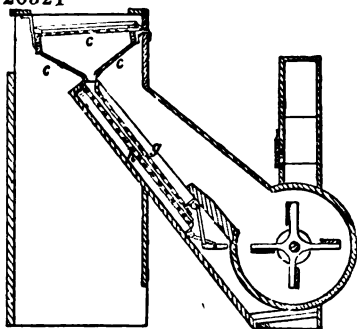
19310

19860

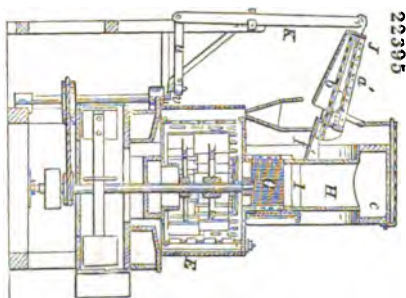
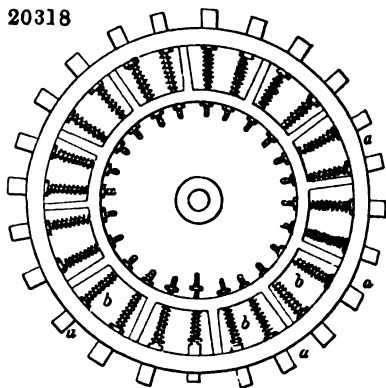




20521

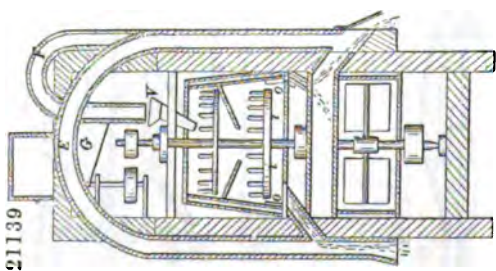
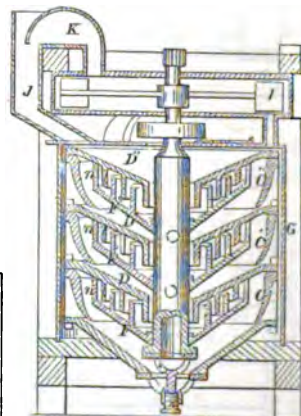


20318

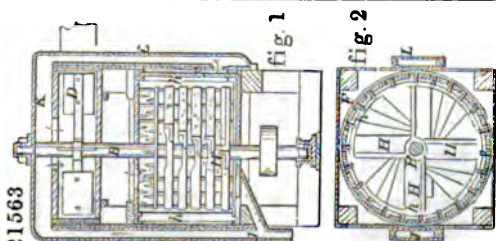


22395

21202



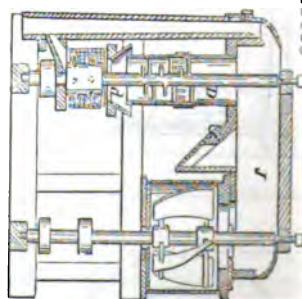
21139



21563

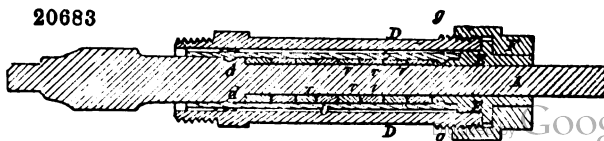
fig. 1

fig. 2

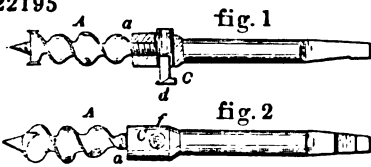


22128

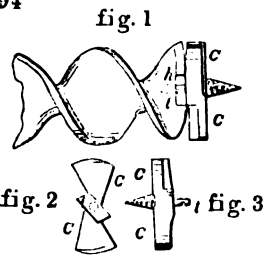
20683



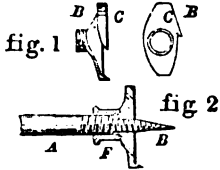
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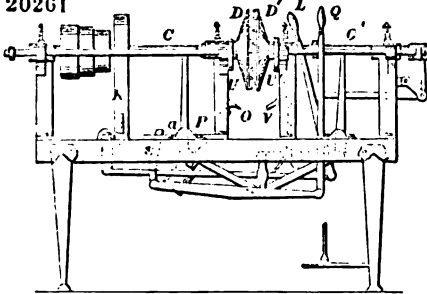
22394



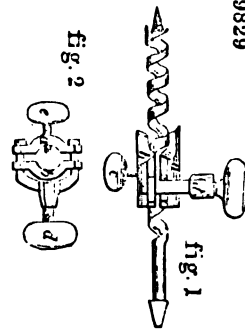
21179



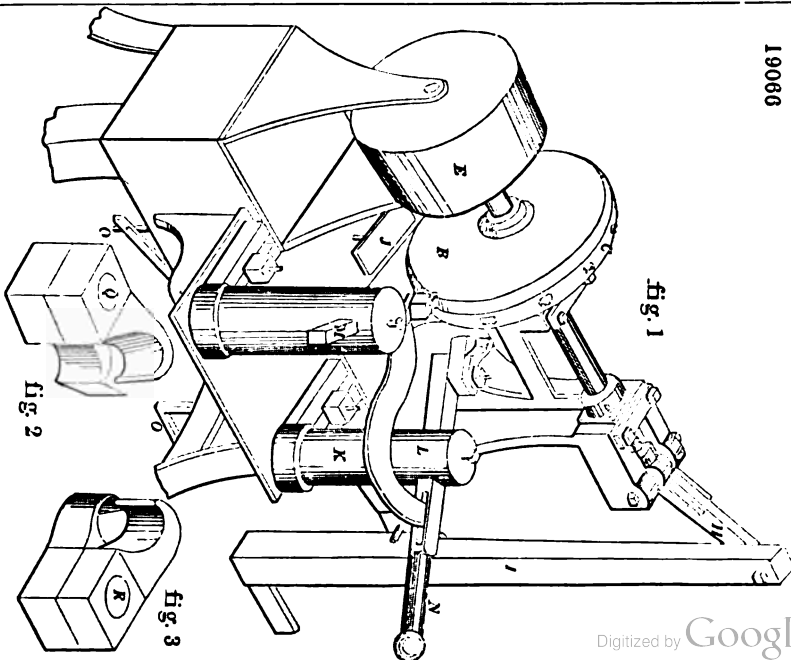
20261



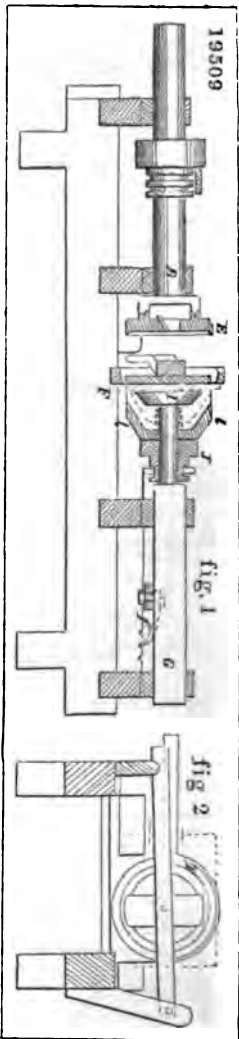
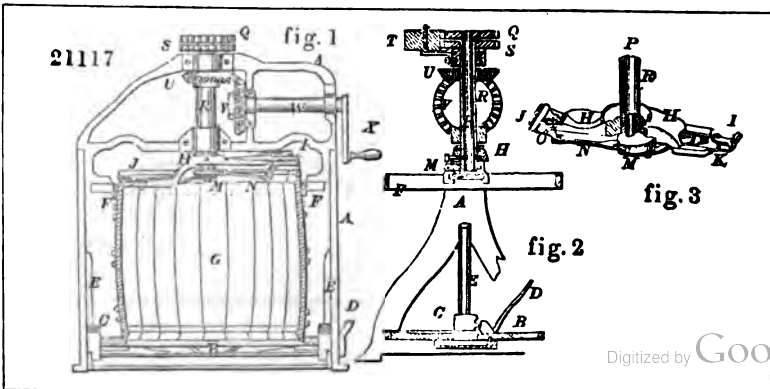
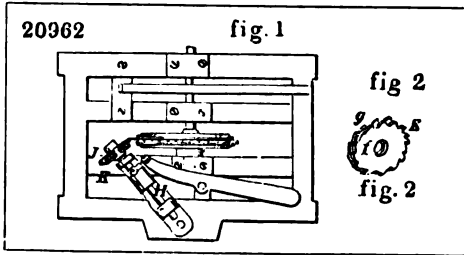
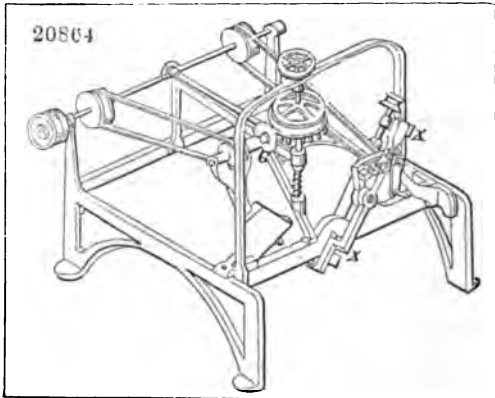
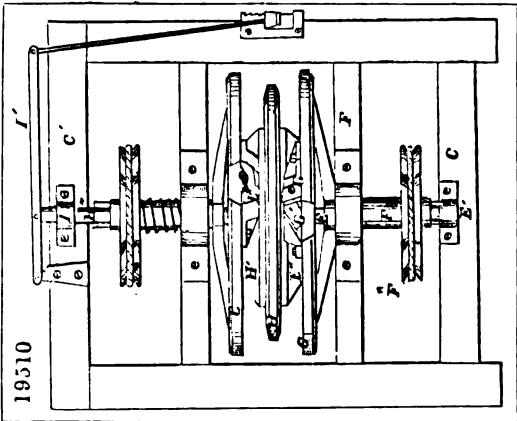
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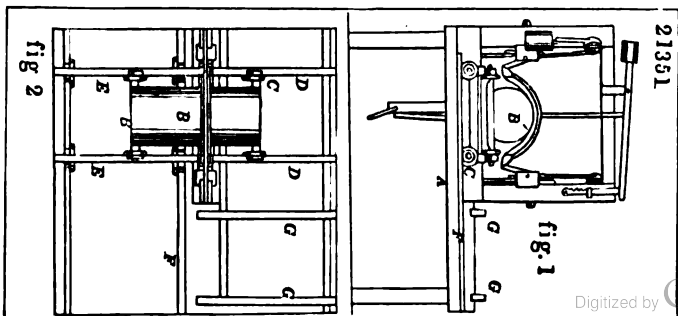
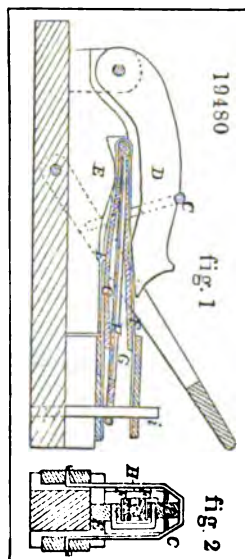
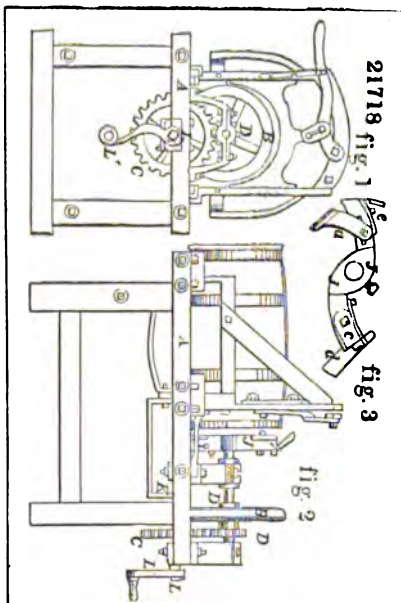
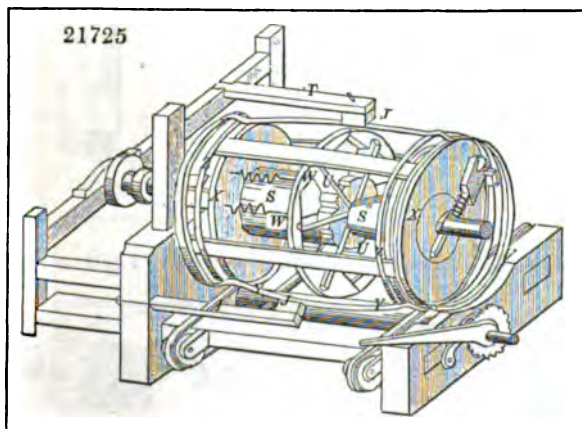
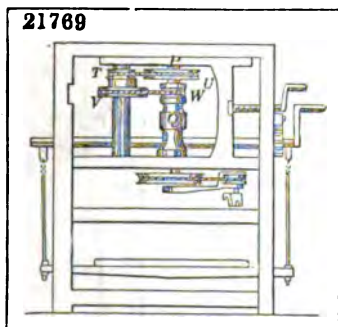
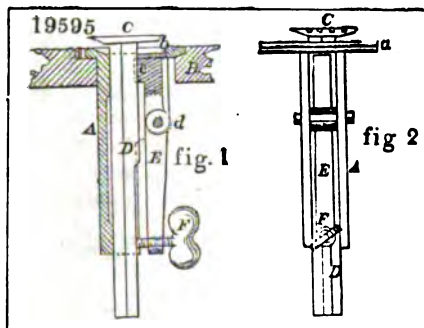


19066











22101

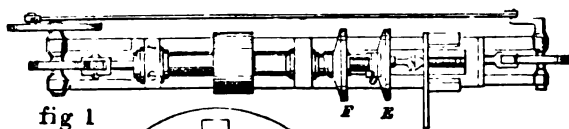


fig 1

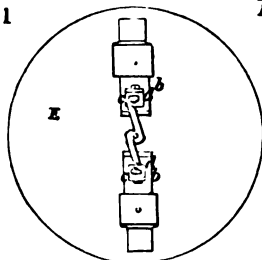


fig. 2

18982

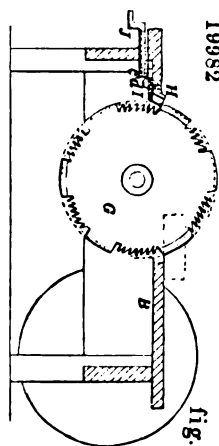


fig. 1

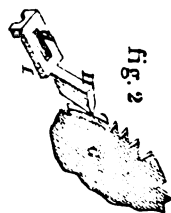
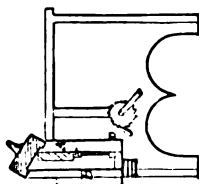


fig. 2

fig. 1



21247

fig. 2



19035

fig. 1

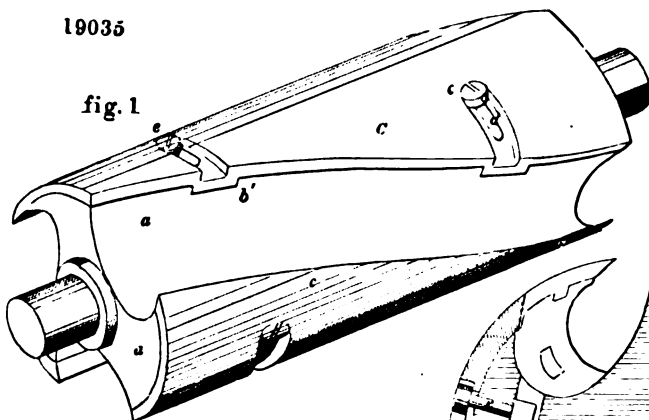
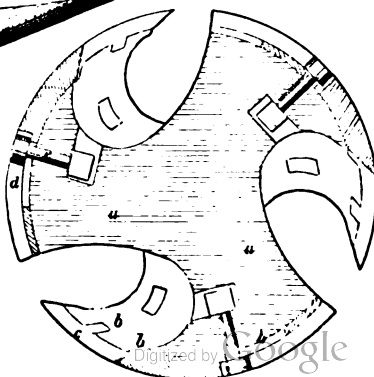


fig. 2



20918

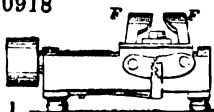
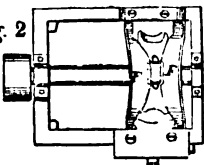
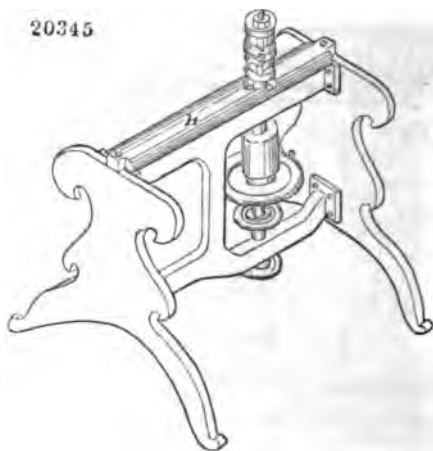


fig. 1

fig. 2



20345



19406

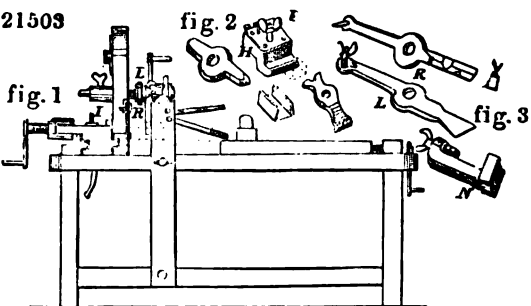
fig. 1



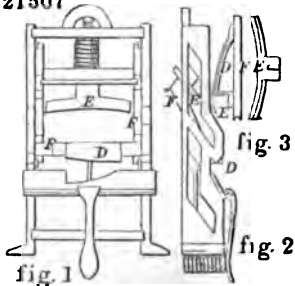
fig. 2



21503



21507



22369

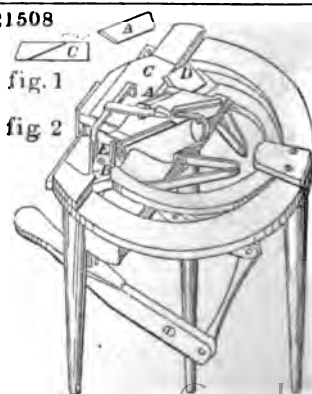


fig. 1

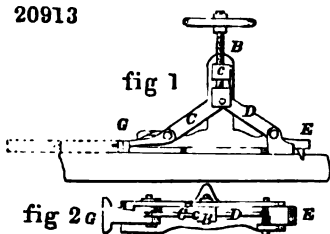
fig. 2



21508



20913



21379

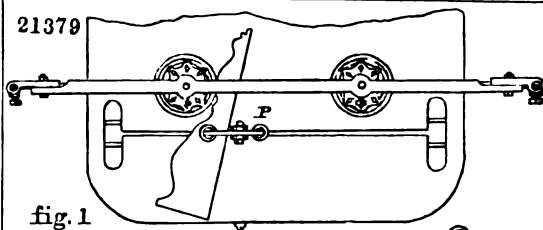


fig. 1

fig. 2

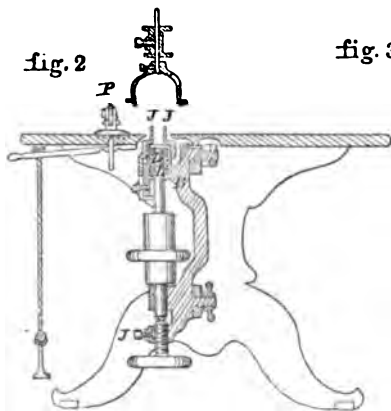


fig. 3



20502

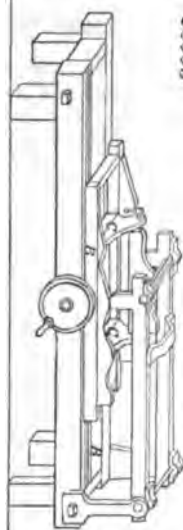


fig. 1

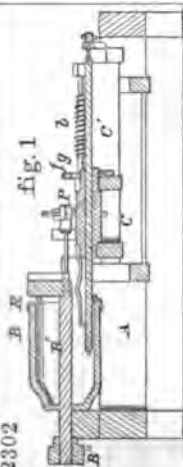
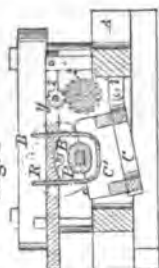


fig. 2



21861

fig 1

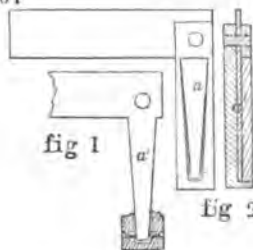
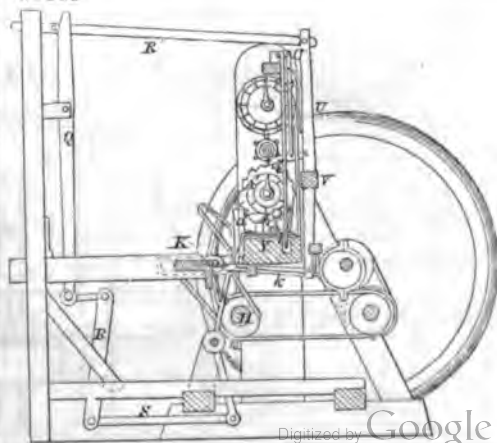
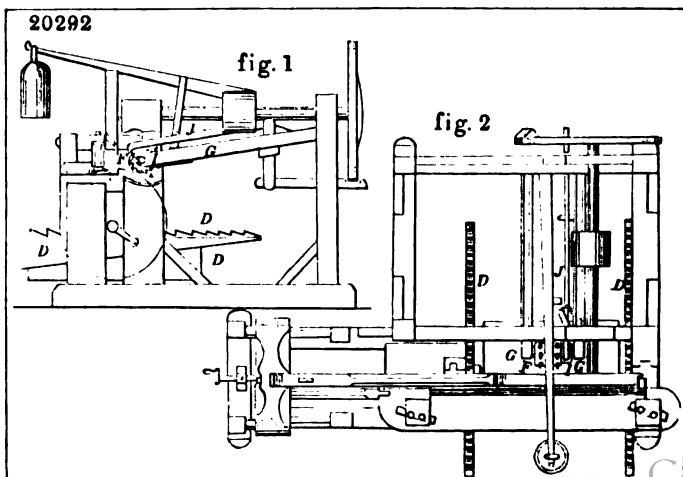
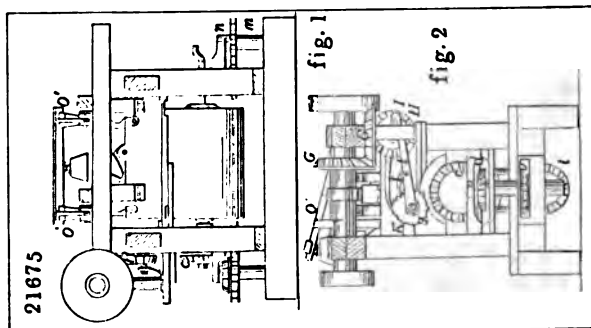
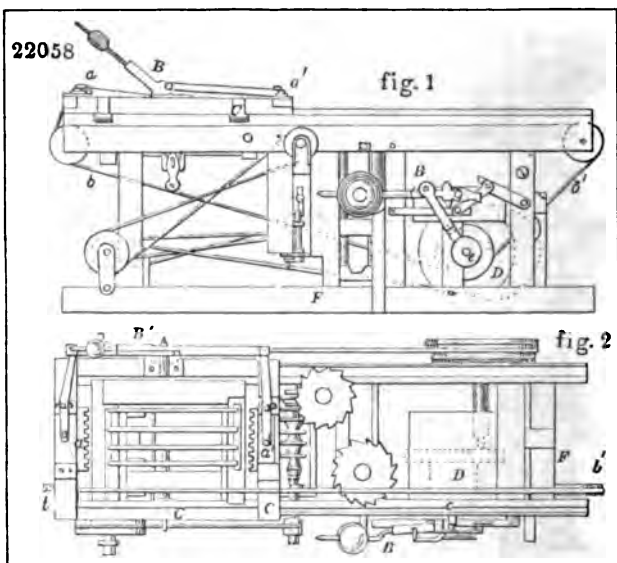


fig 2

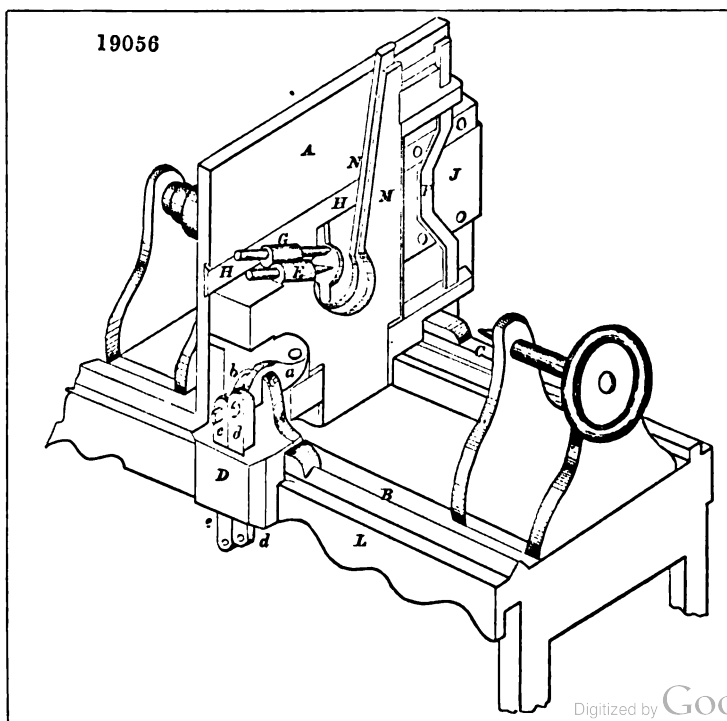
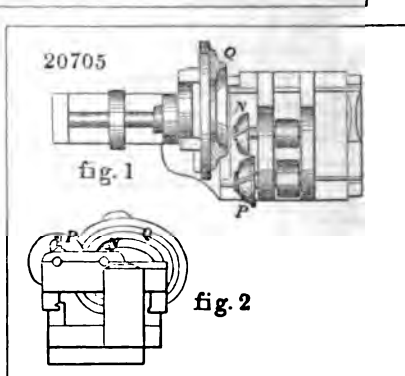
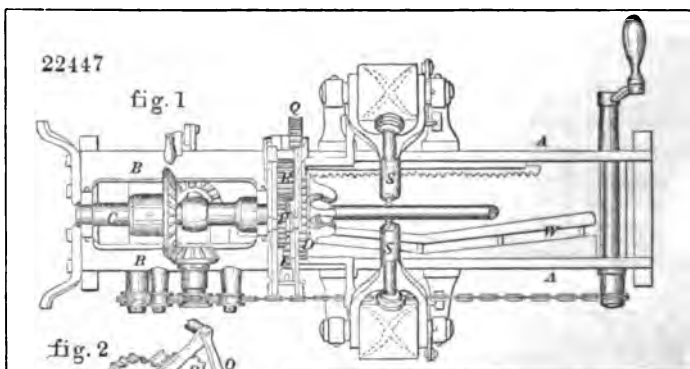
22449

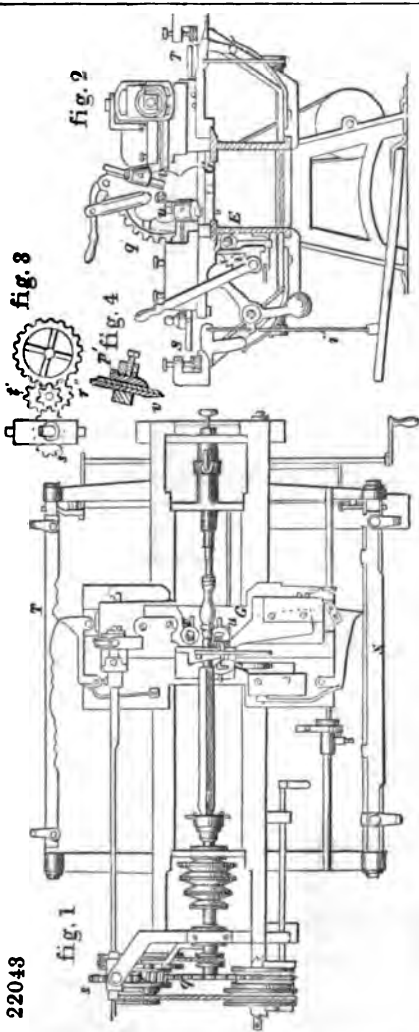
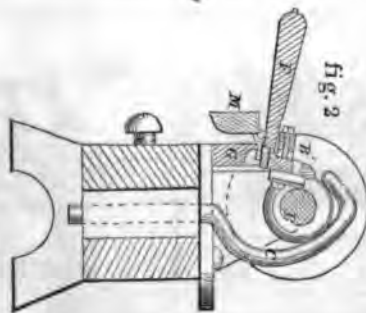
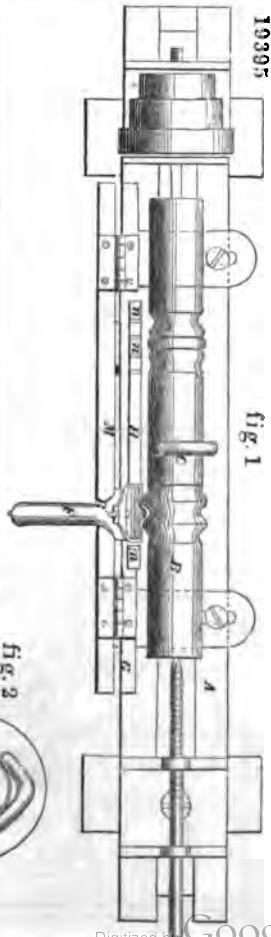




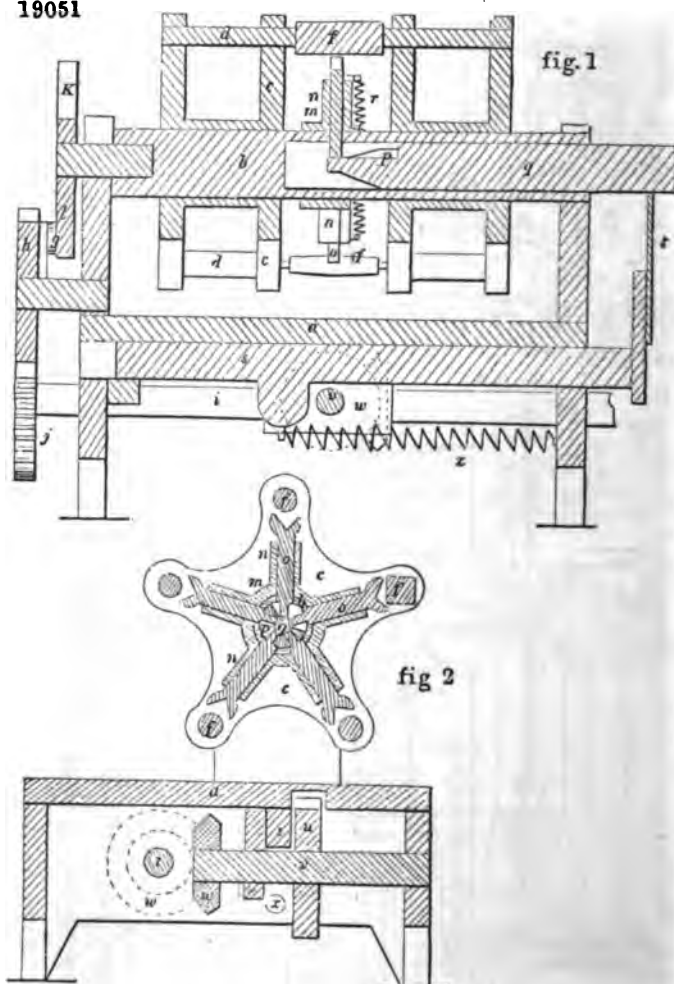




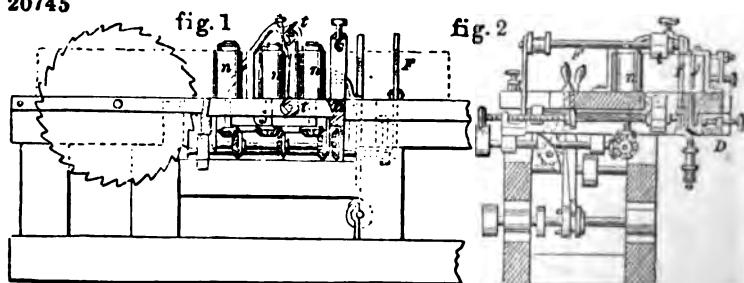




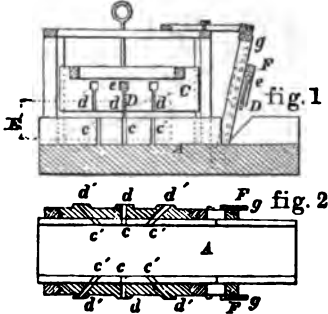
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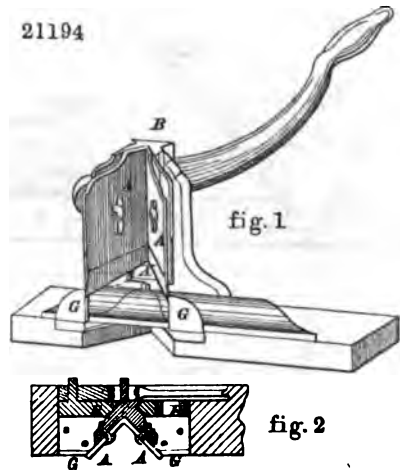
20745



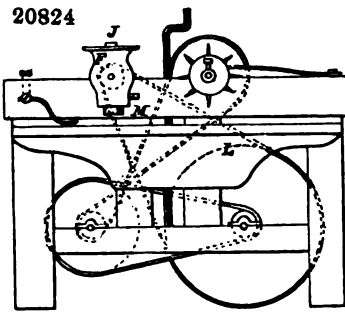
22386



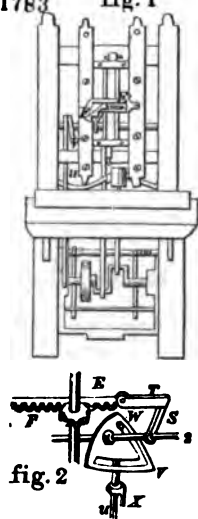
21194



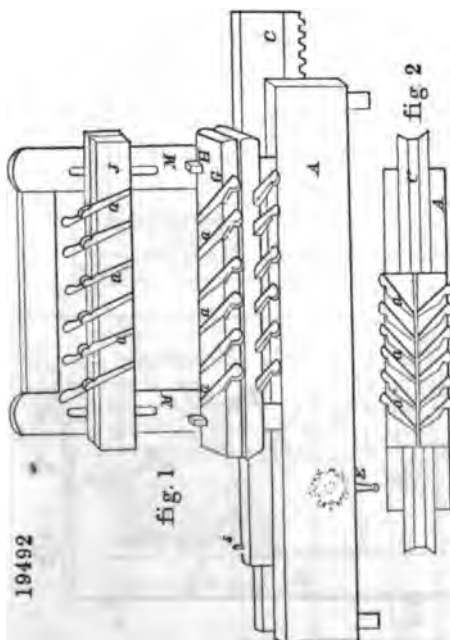
20824



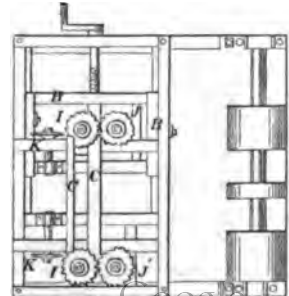
21783 fig. 1



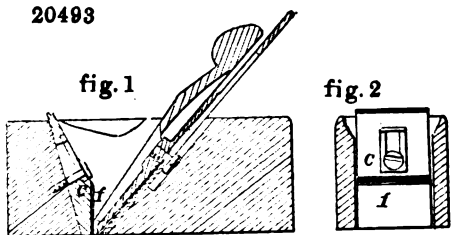
19492



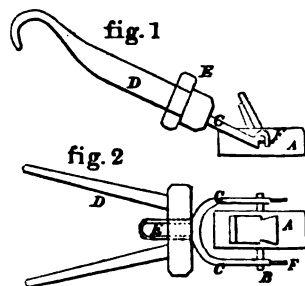
22222



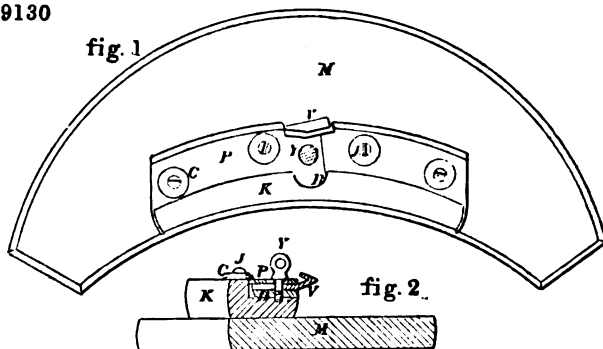
20493



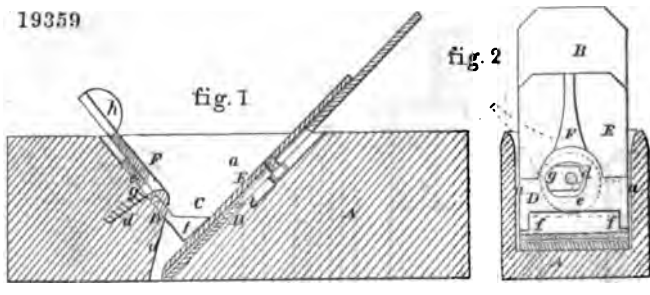
19539



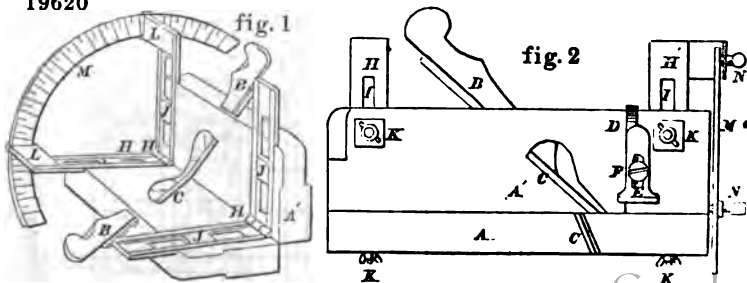
19130



19359



19620



20615

fig. 1

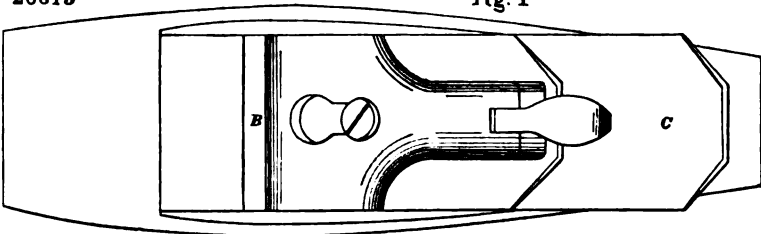


fig. 3

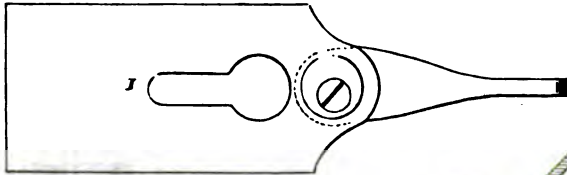
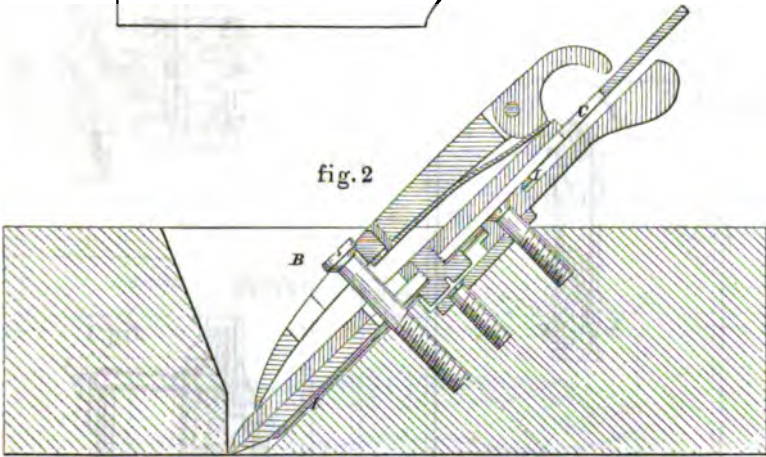
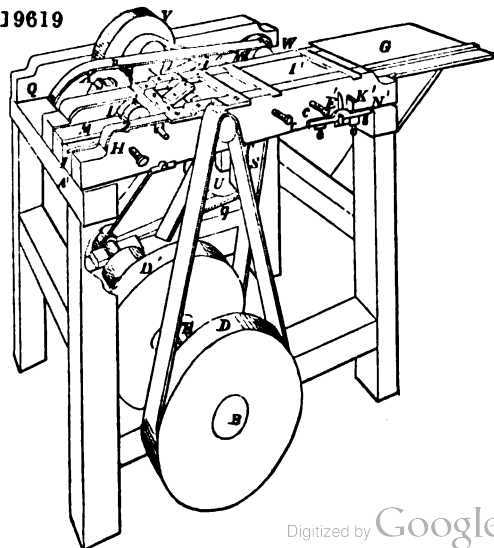


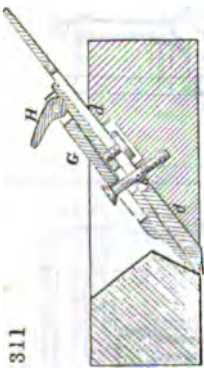
fig. 2



19619



21311

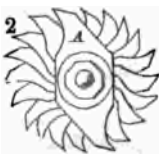


21782

fig. 1



fig. 2



20527

fig. 1

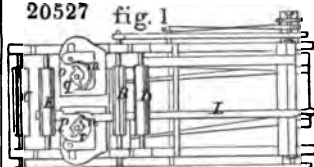
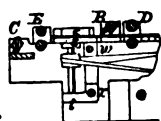


fig. 2



21618

fig. 1

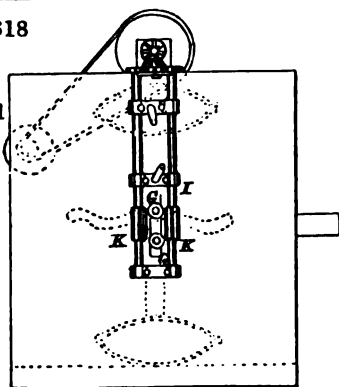
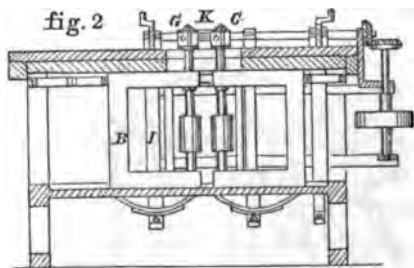


fig. 2



19702

fig. 1

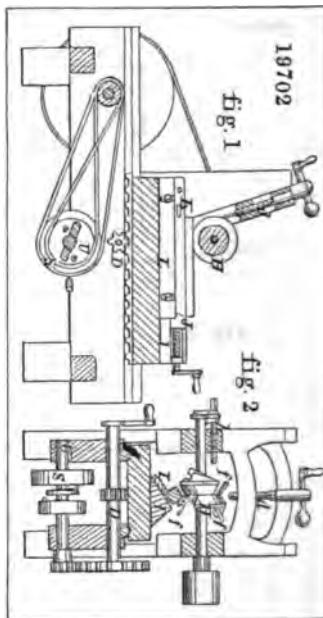
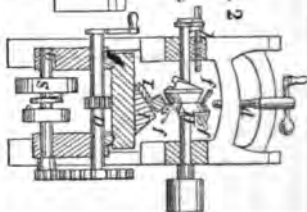


fig. 2



21720

fig. 1

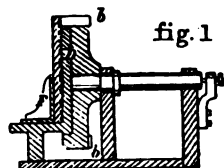
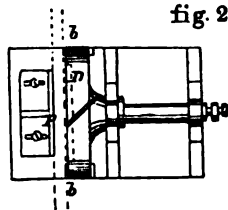


fig. 2



20762

fig. 1

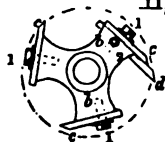


fig. 2



19110

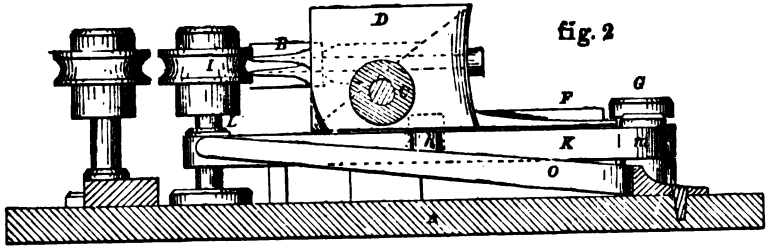
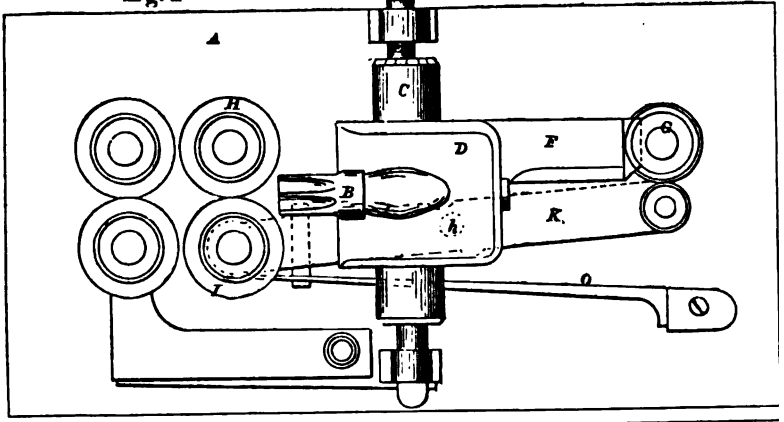


fig. 1



20999



fig. 1



fig. 2

19454

fig. 2

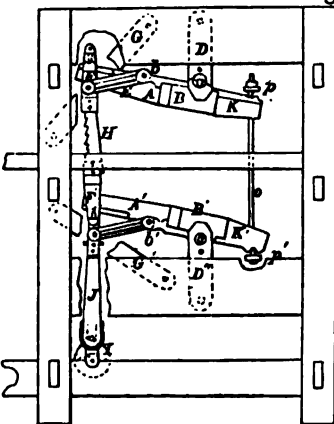
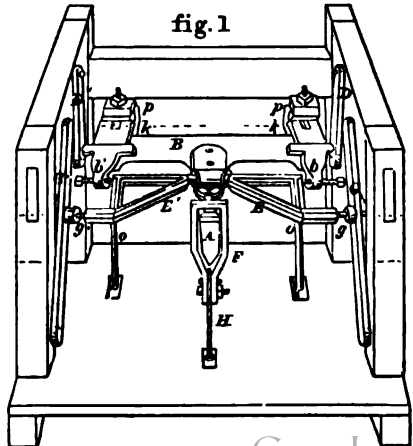


fig. 1





21588

fig. 1

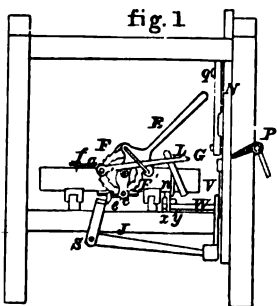
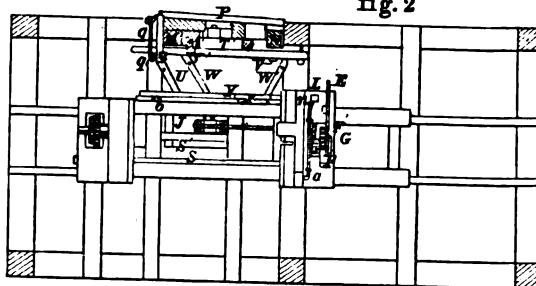


fig. 2



22268

fig. 1

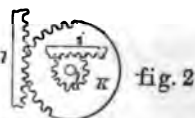
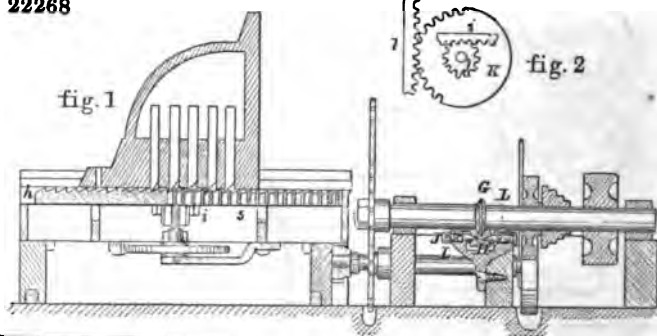


fig. 2

20660

fig. 1

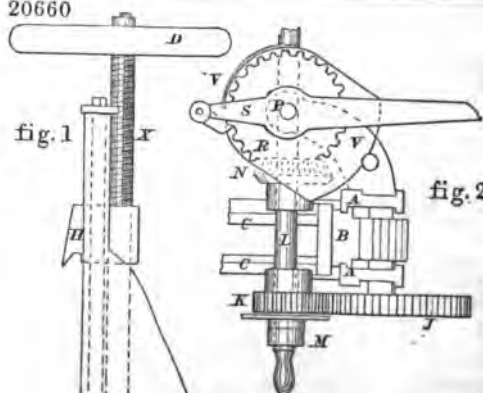
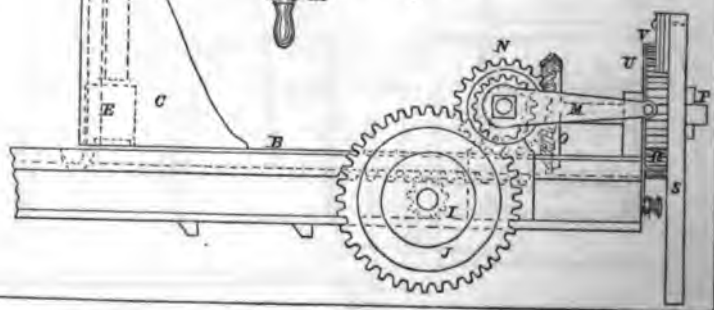
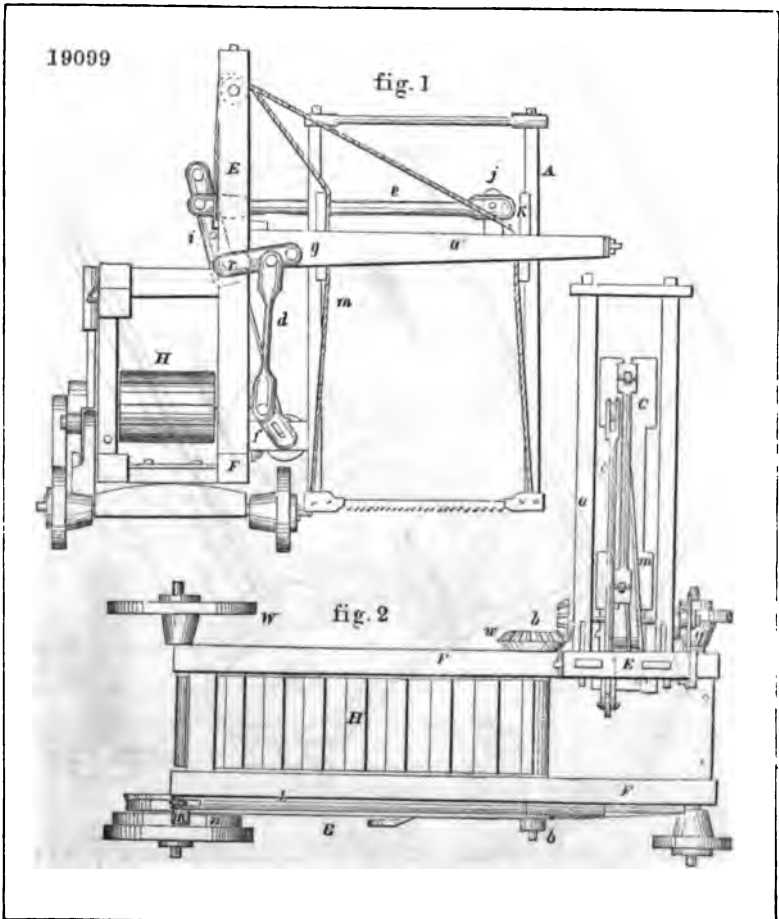
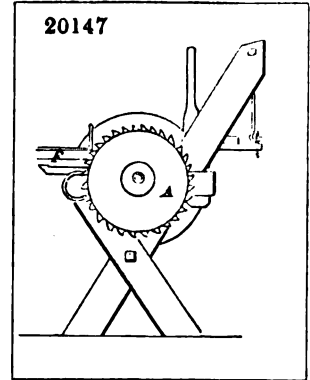
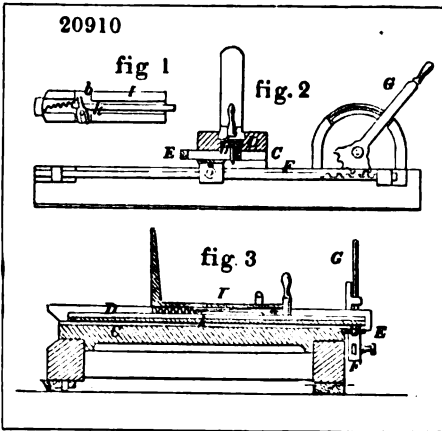


fig. 2





19536

fig 1

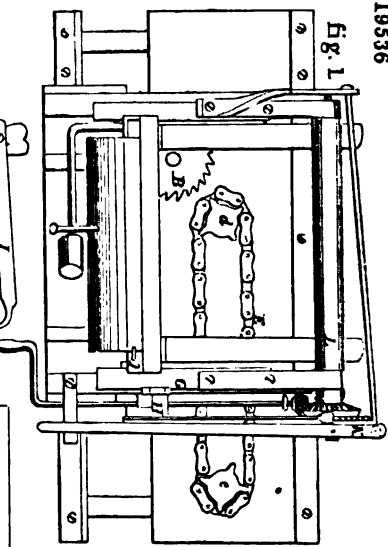
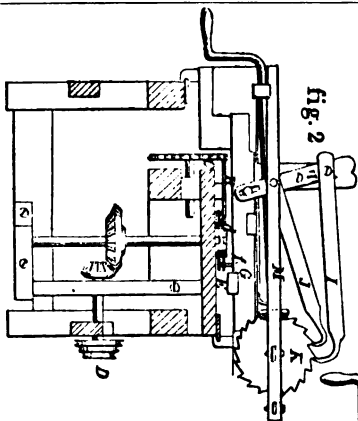


fig. 2



19128

fig 1

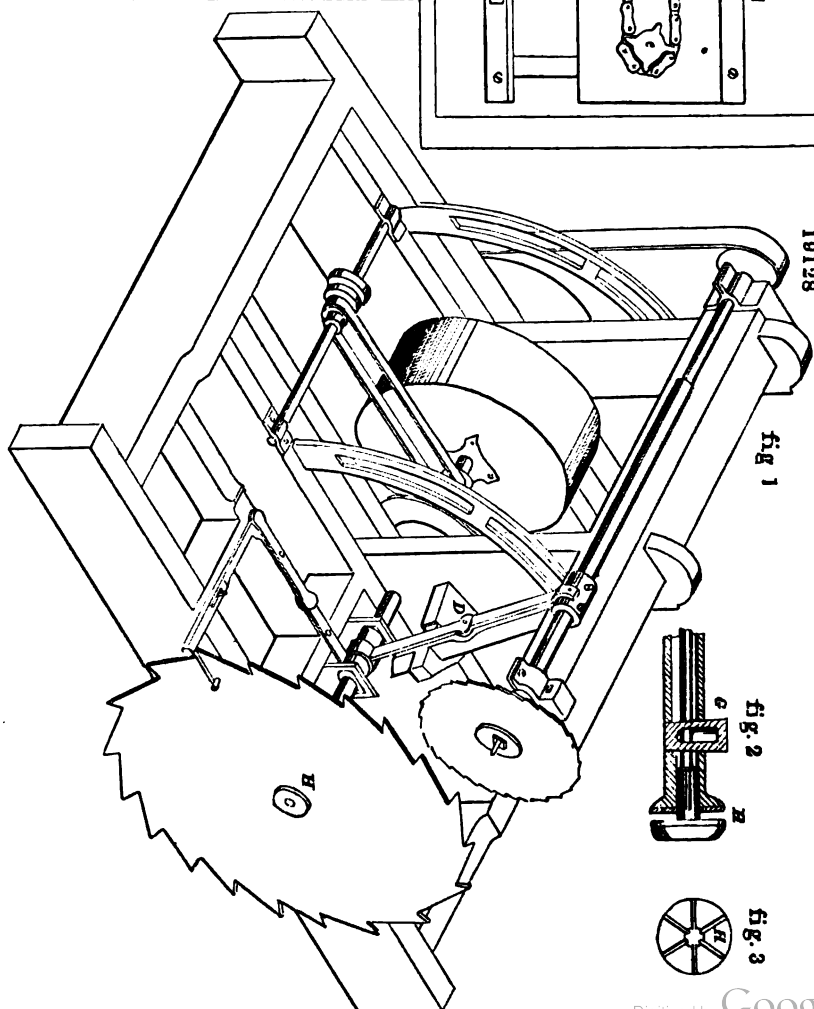


fig. 2



fig. 3



19145

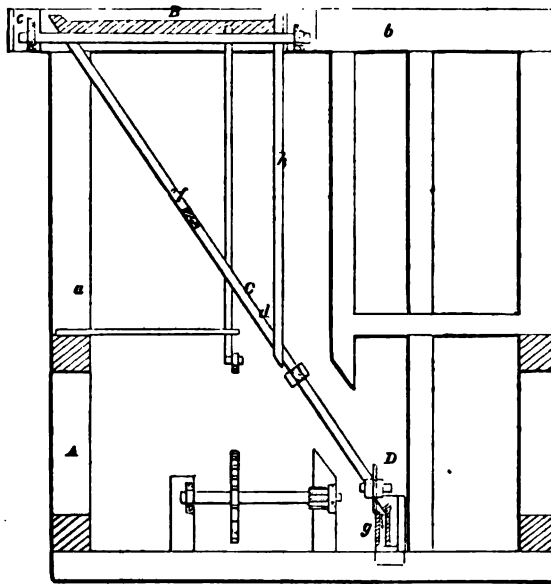


fig. 1

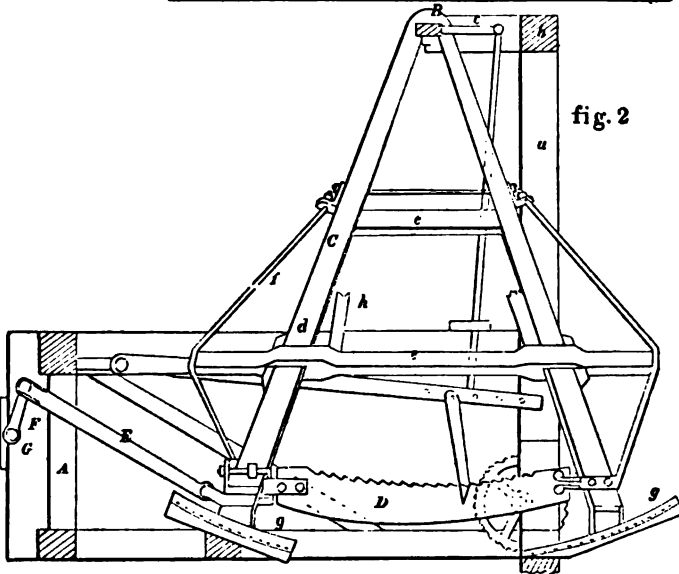
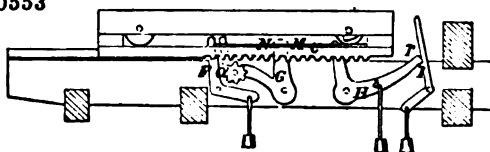
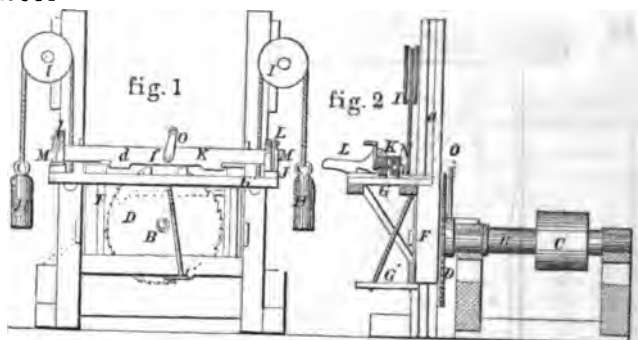


fig. 2

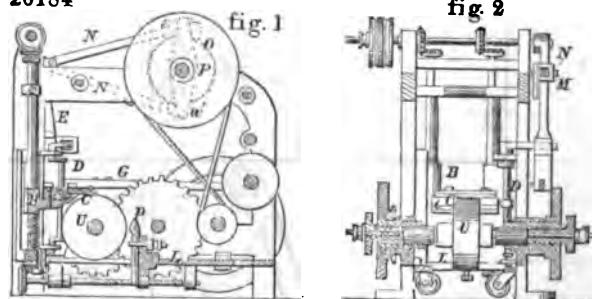
20553



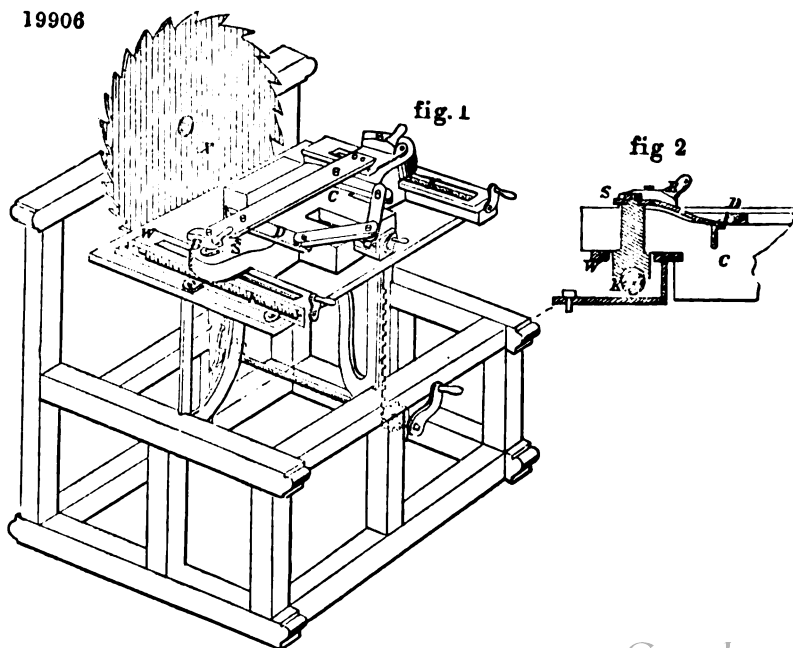
19644



20184



19906



19870

fig. 1

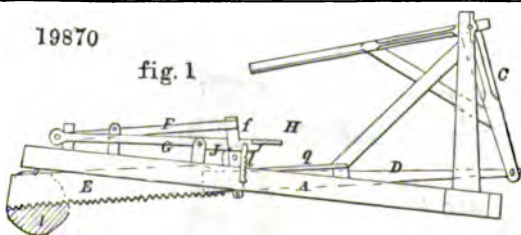
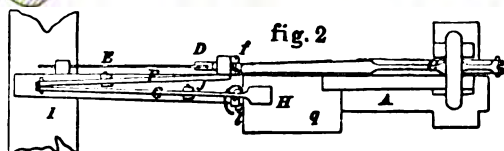


fig. 2



20995

fig. 1

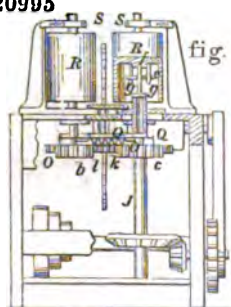
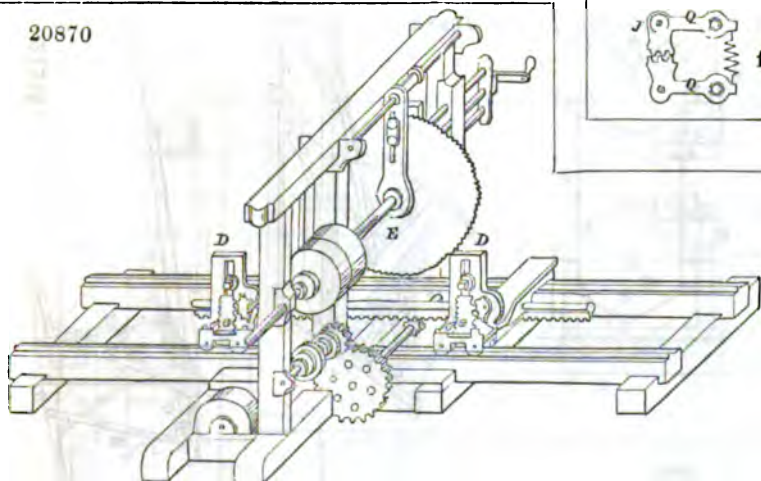


fig. 2



20870



19801

fig. 1

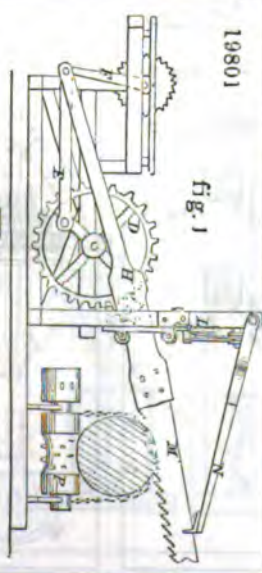
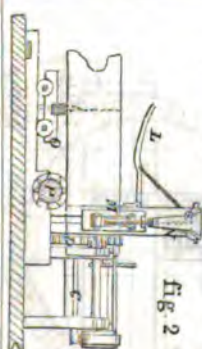
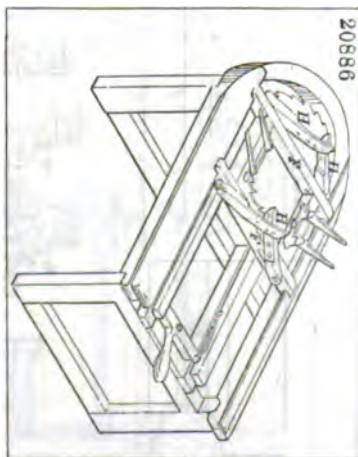


fig. 2



20886



21177

fig. 1

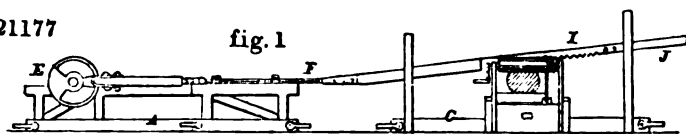
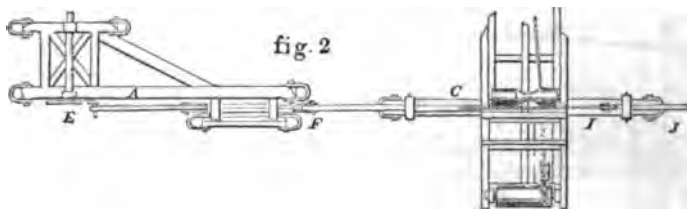


fig. 2



21482

fig. 2

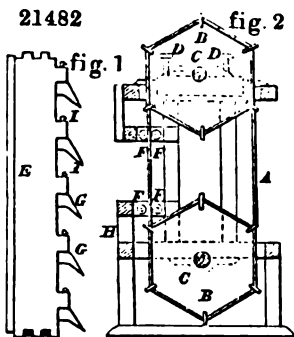
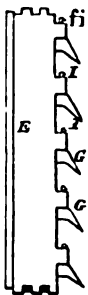
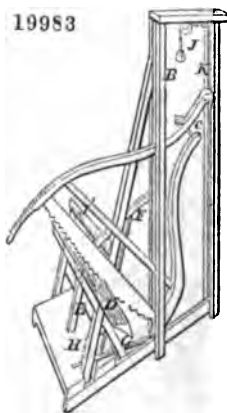


fig. 1



19983



21256



21200

fig. 1

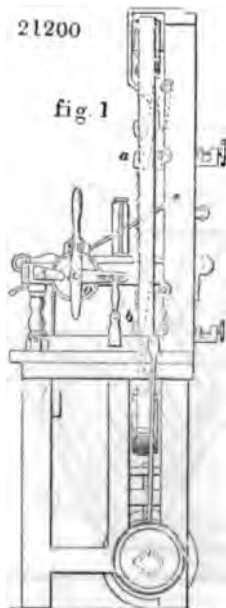


fig. 2



fig. 3



fig. 4



fig. 5

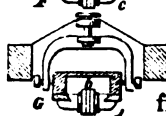
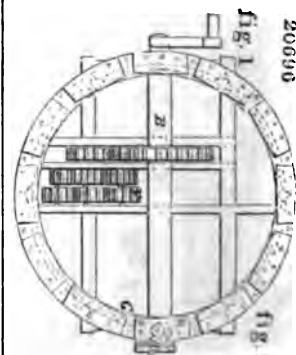
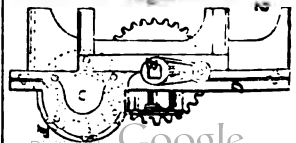


fig. 1



20696

fig. 2



19168

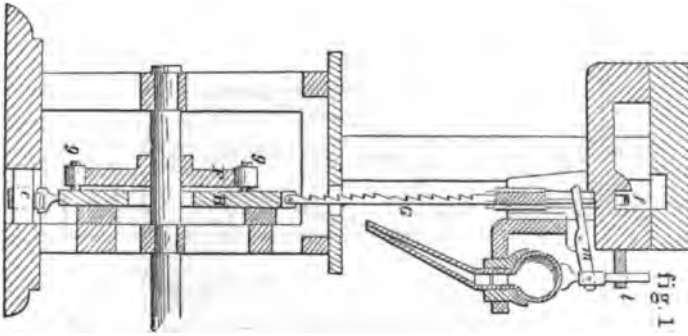
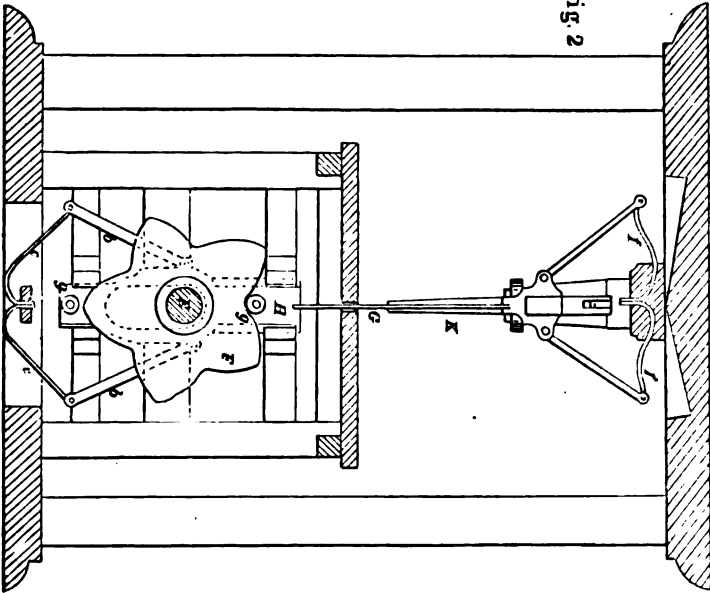


fig. 2



20900

fig. 1

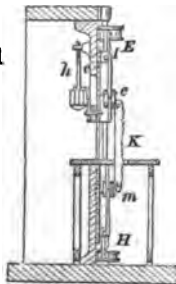
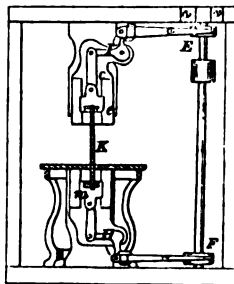


fig. 2





19166

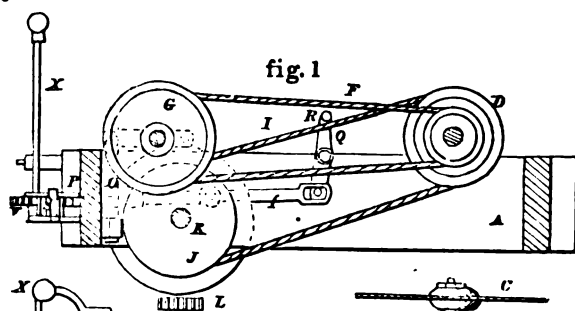
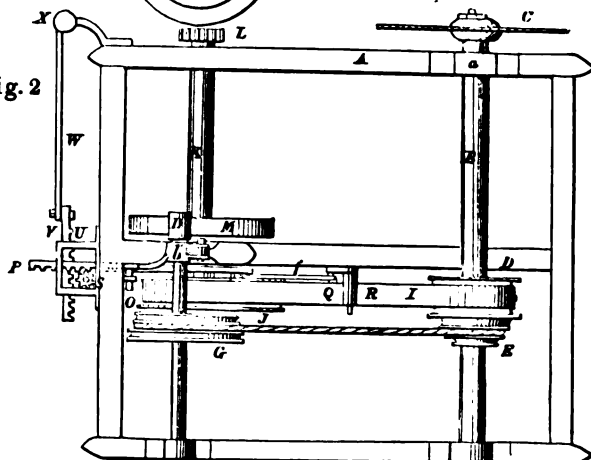
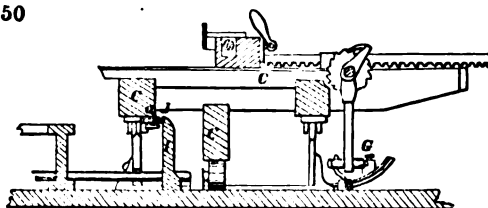


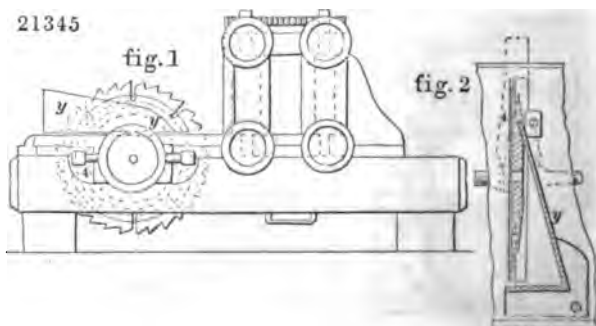
fig. 2

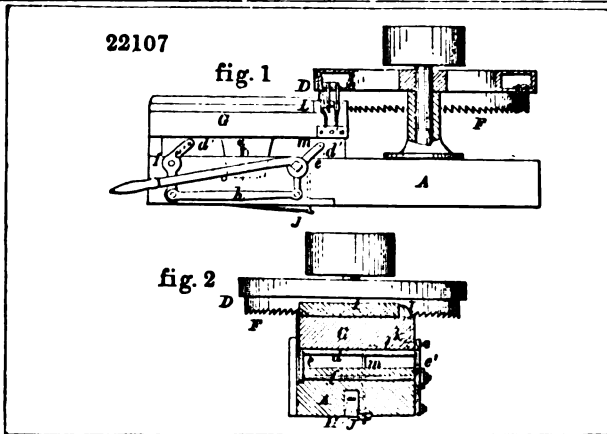
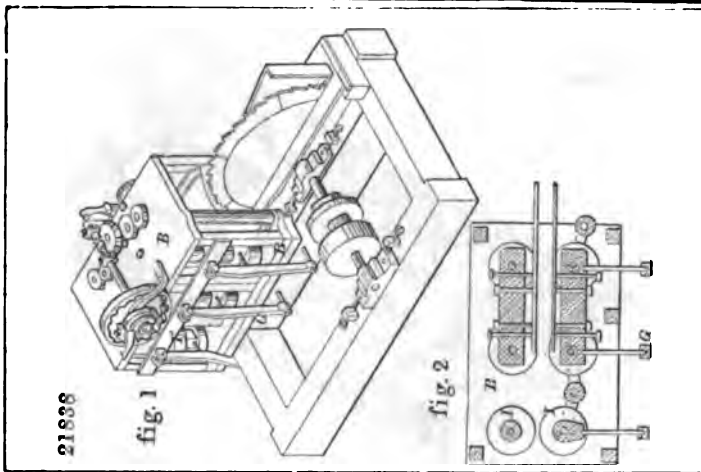


20150

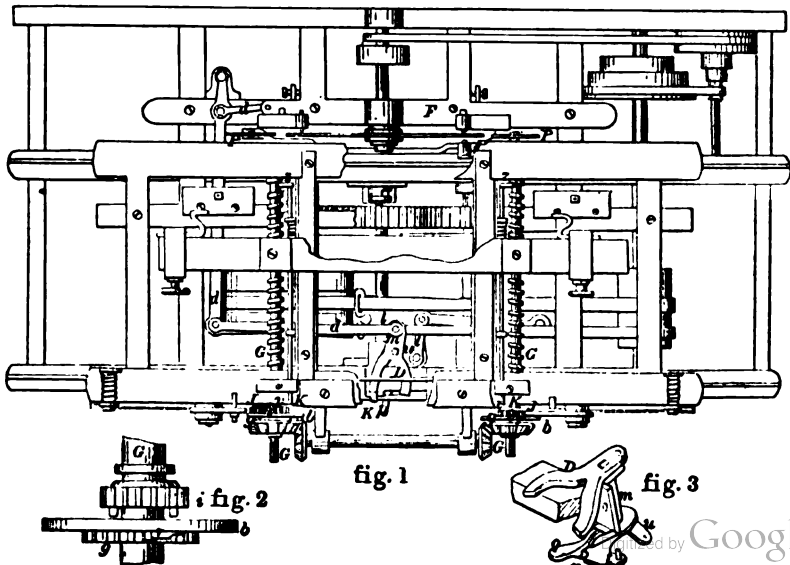


21345

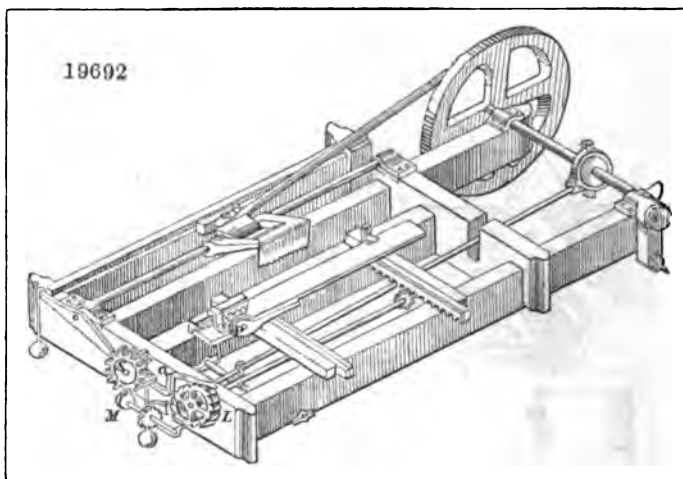




19774



19692



20135

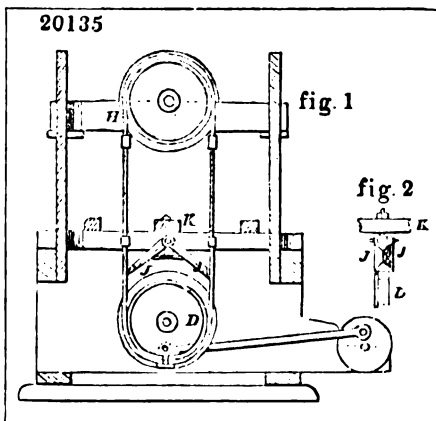


fig. 1

fig. 2

21651

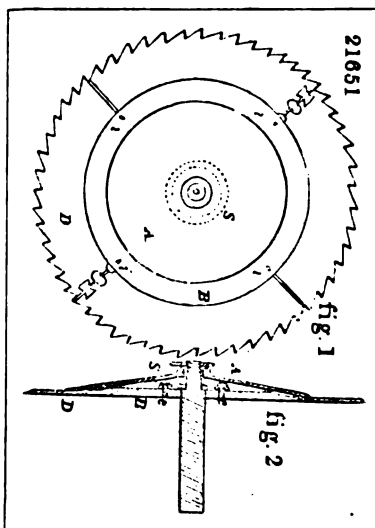
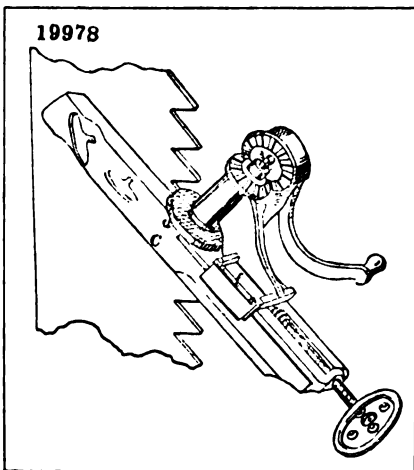


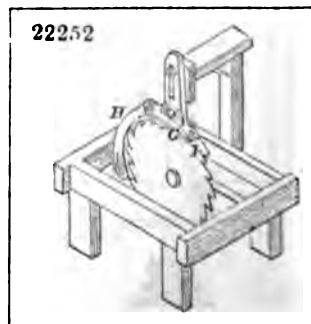
fig. 1

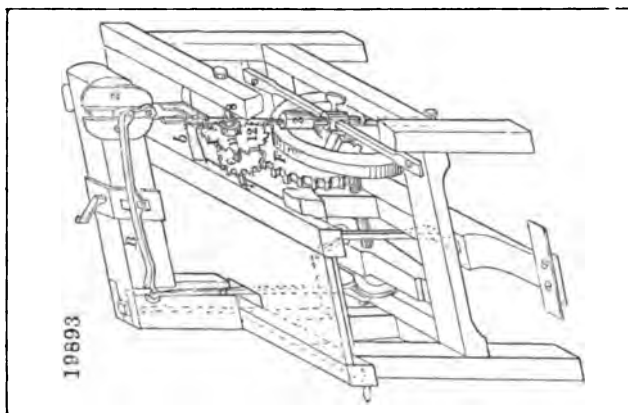
fig. 2

19978

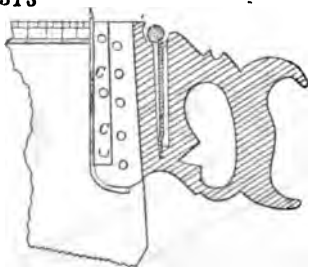


22252

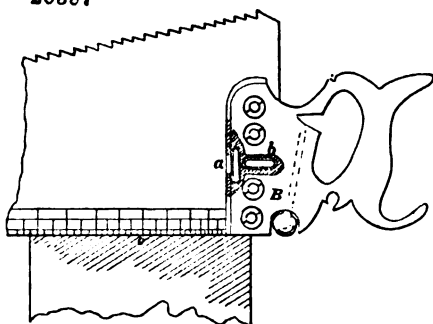




20313



20337



19300

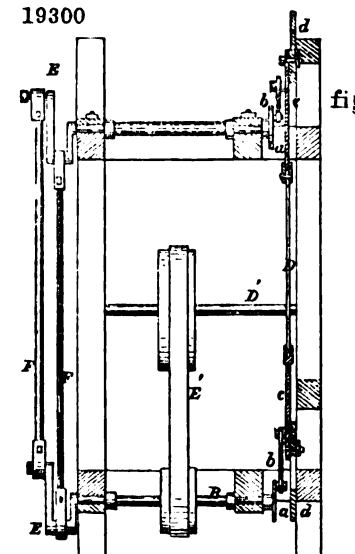
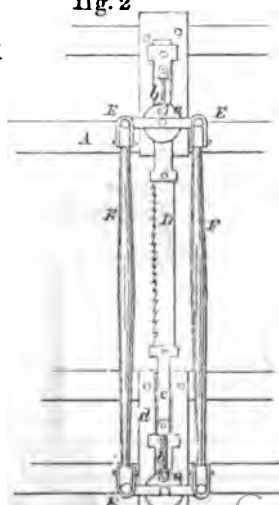
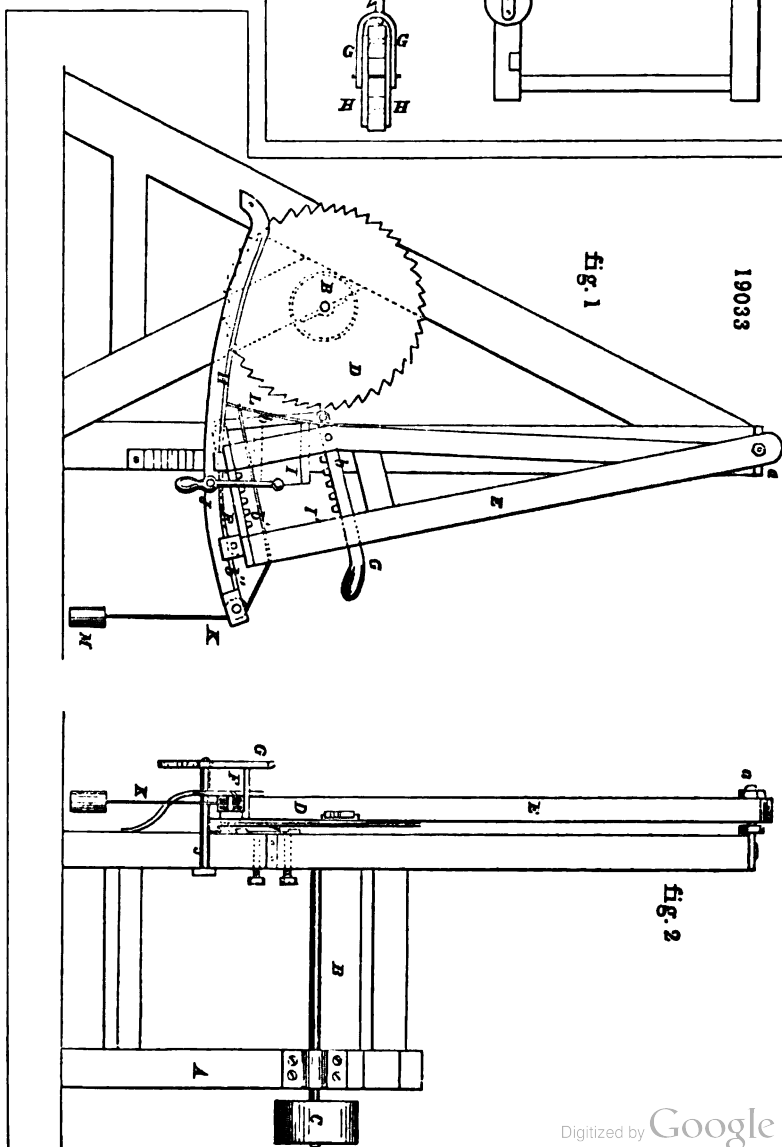


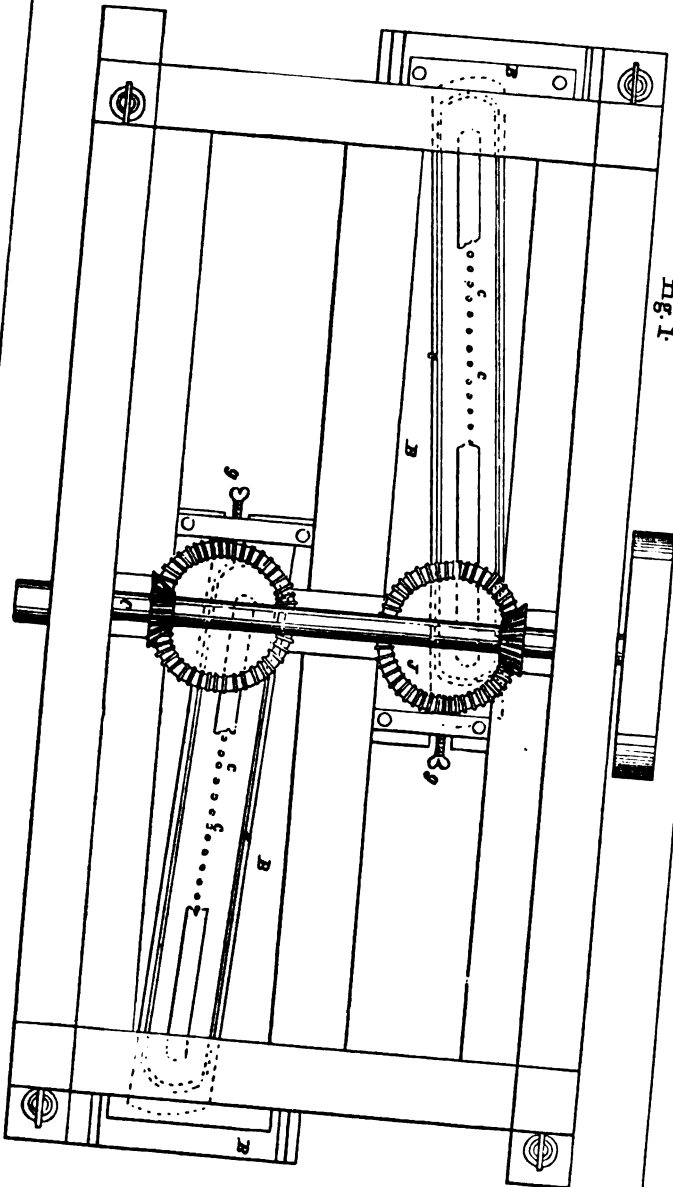
fig. 2





19136

fig. 1.



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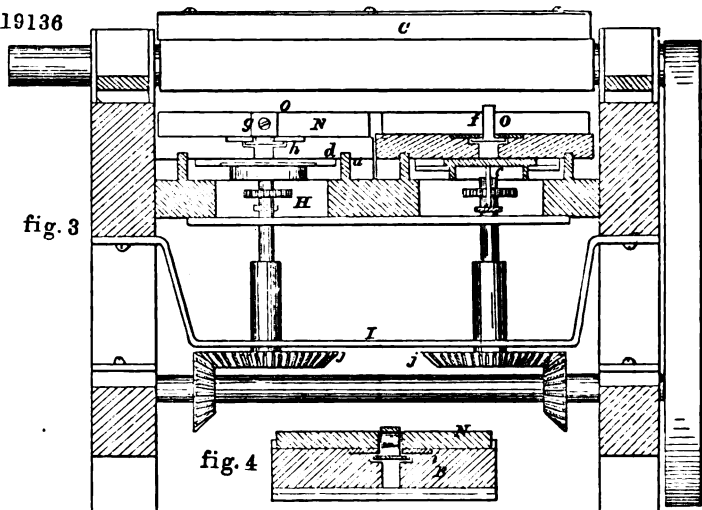
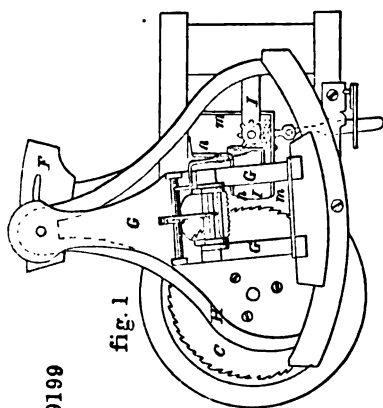


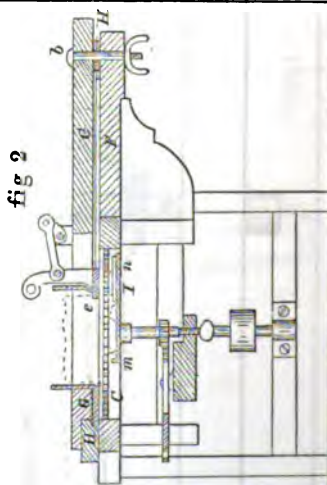
fig. 3

fig. 4



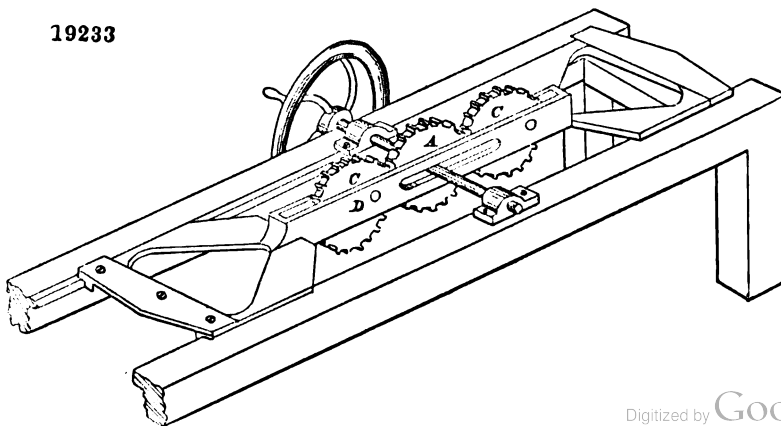
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19293

fig. 1

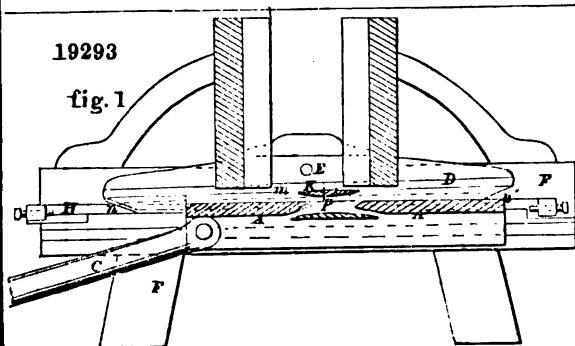


fig. 2

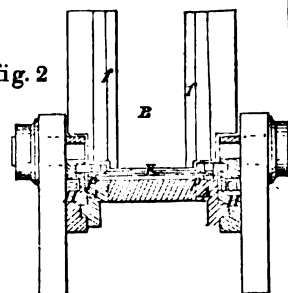
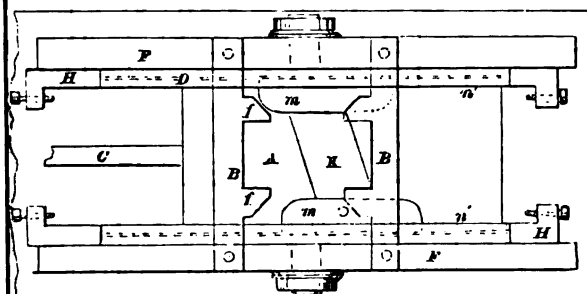
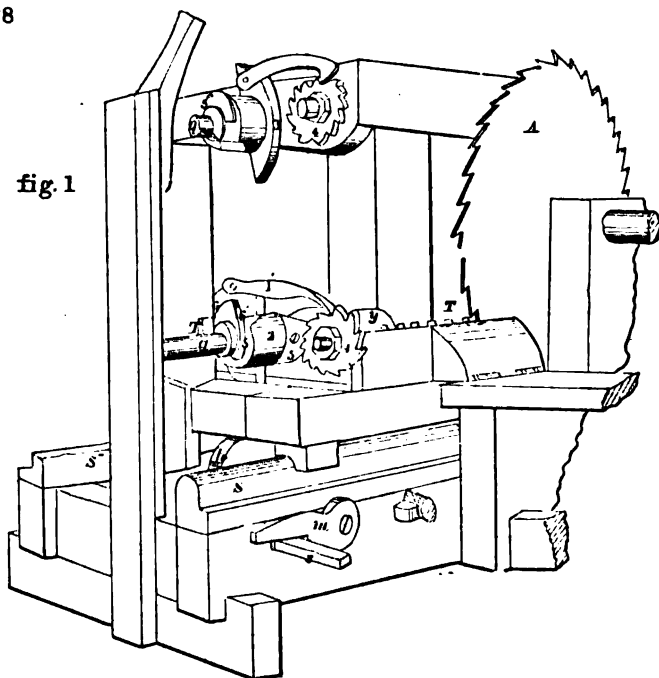


fig. 3



20638

fig. 1





ad 20638

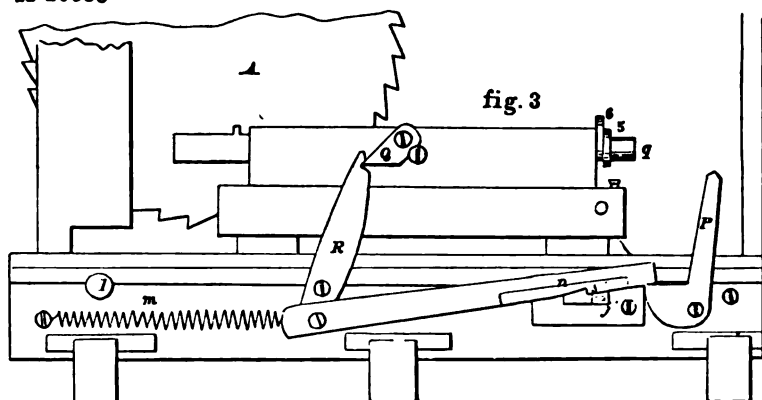


fig. 3

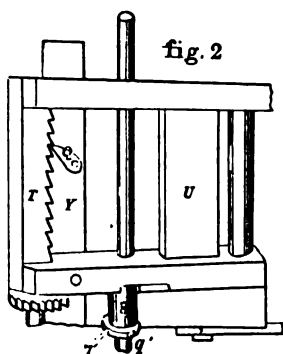


fig. 2

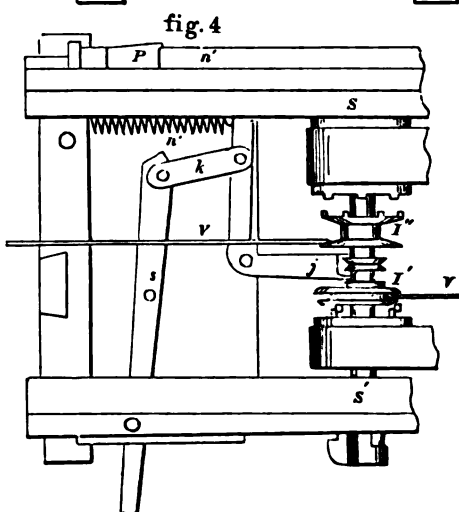


fig. 4



fig. 5

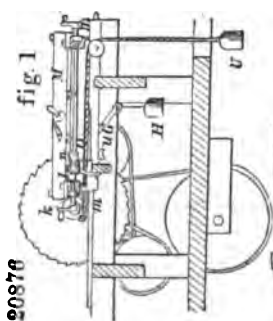


fig. 1

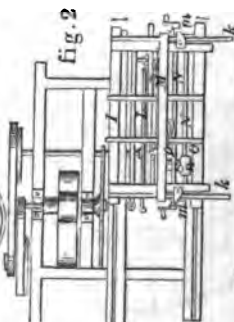


fig. 2

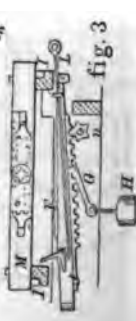
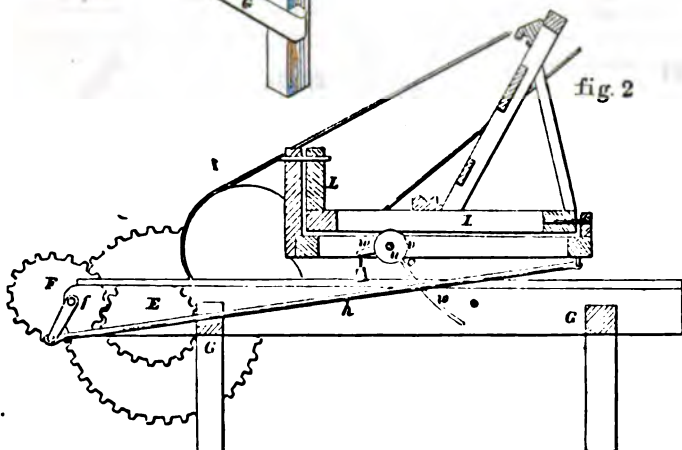
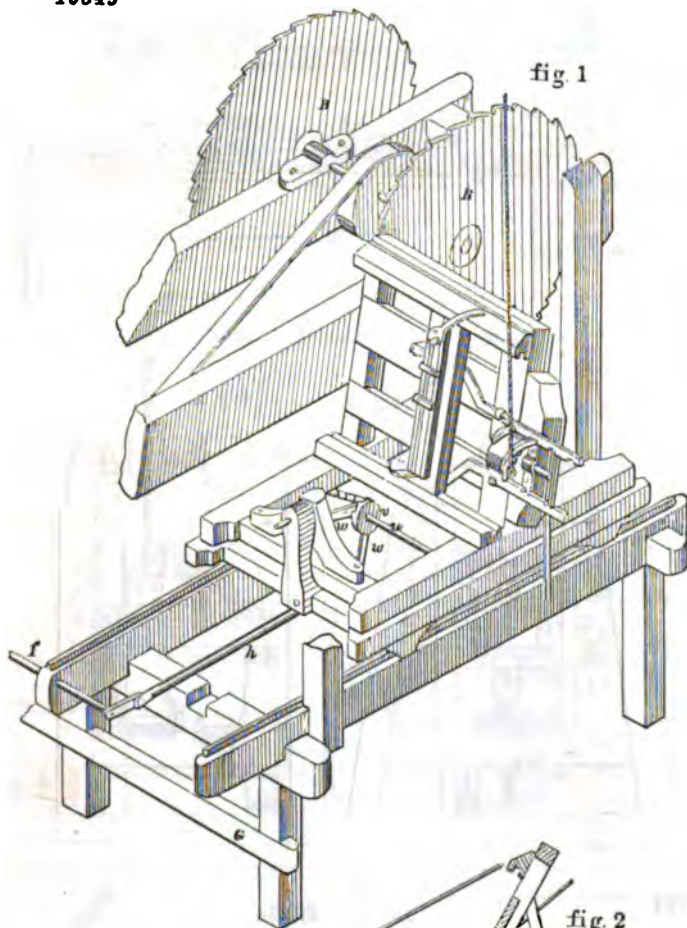


fig. 3

20570

19349



21490

fig. 1

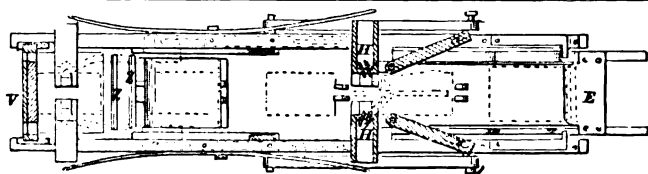


fig. 2

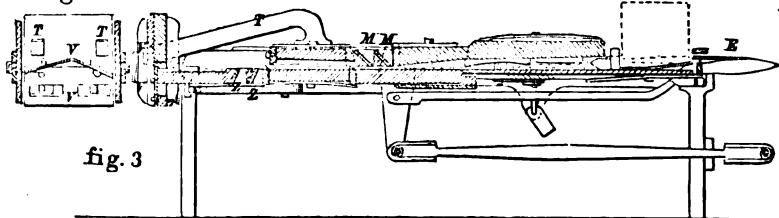
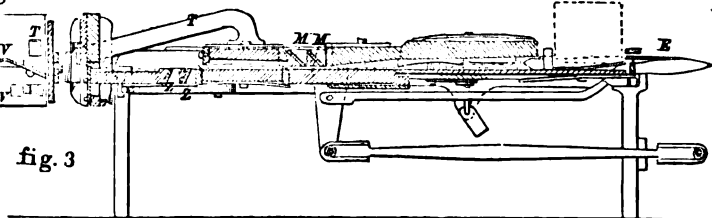


fig. 3



21744

fig. 1

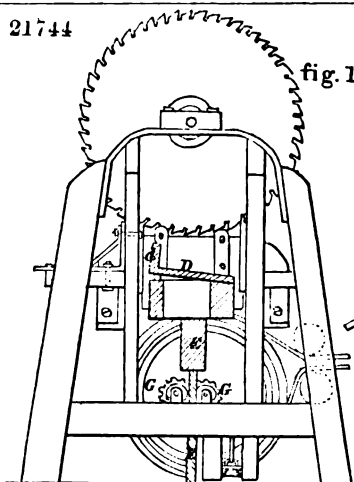
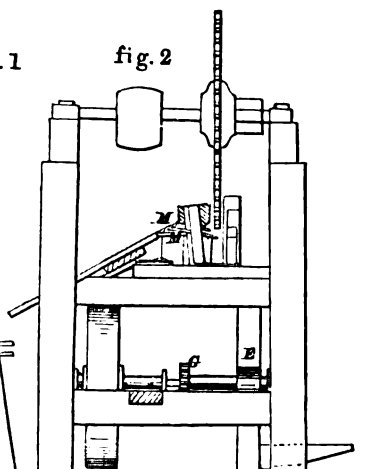


fig. 2



20704

fig. 1

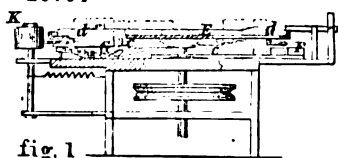
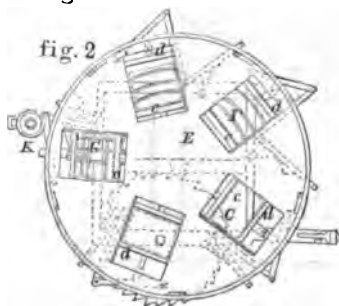


fig. 2



20174

fig. 1

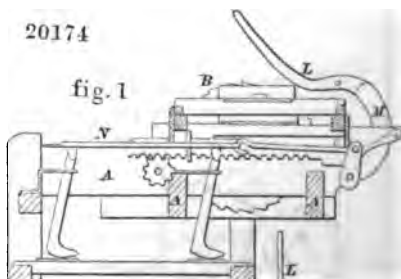
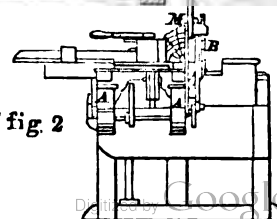
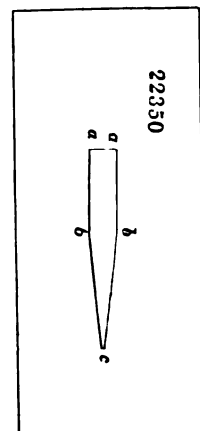
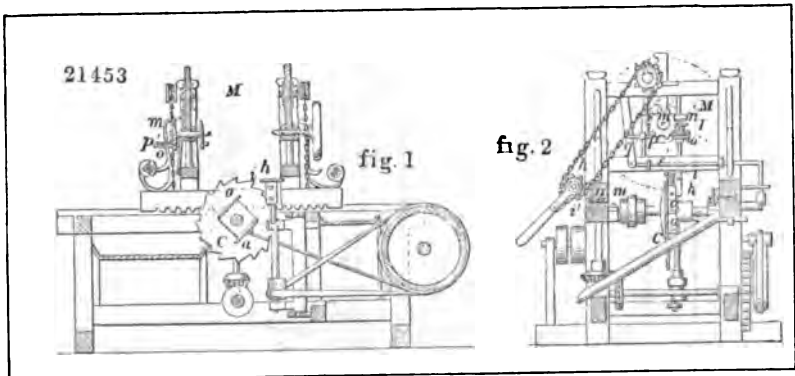
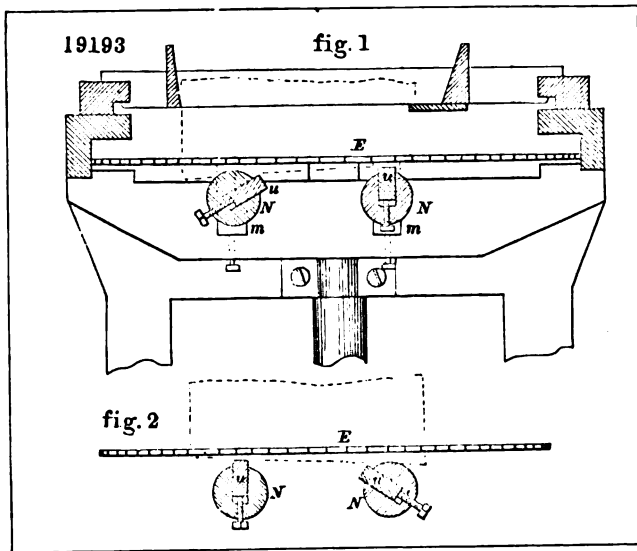


fig. 2





19275

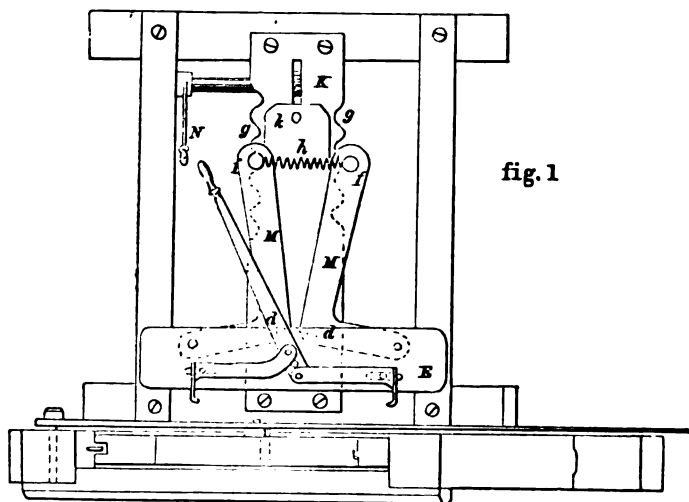


fig. 1

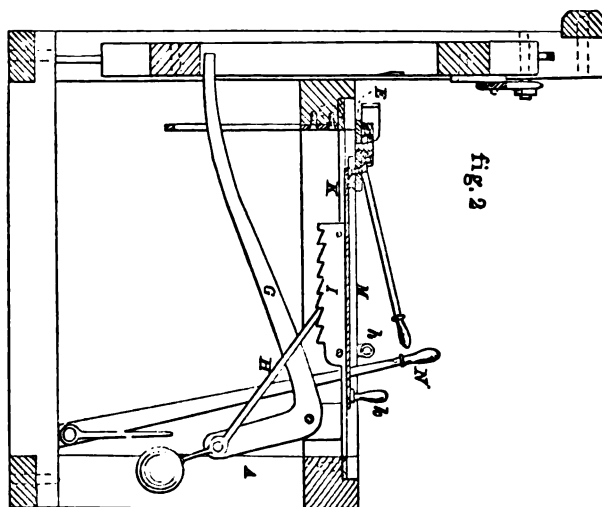


fig. 2

22083

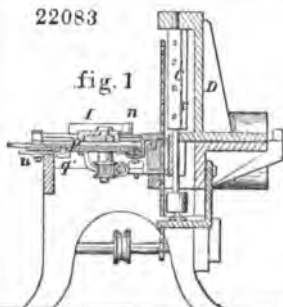


fig. 1

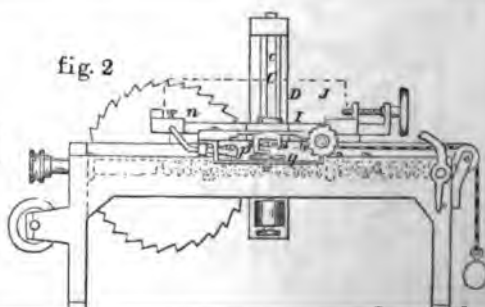


fig. 2

19167

fig. 1

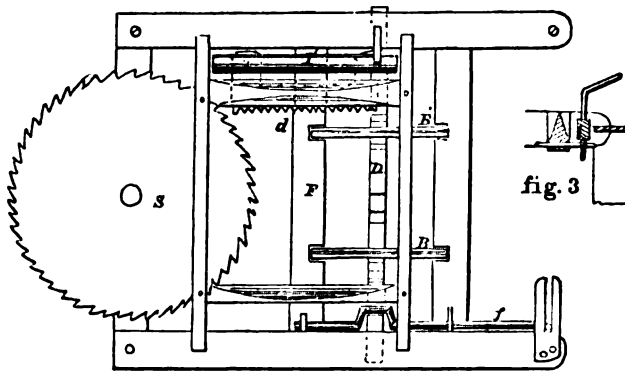
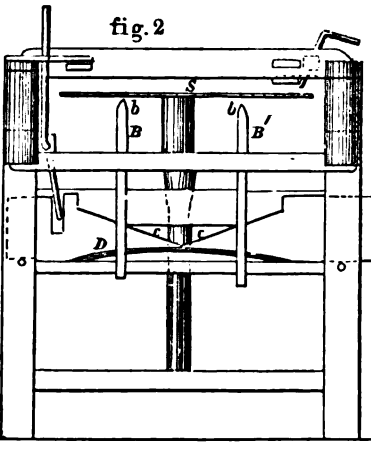
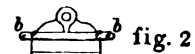
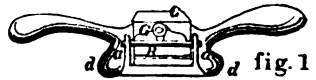


fig. 2



20459



21886

fig. 1

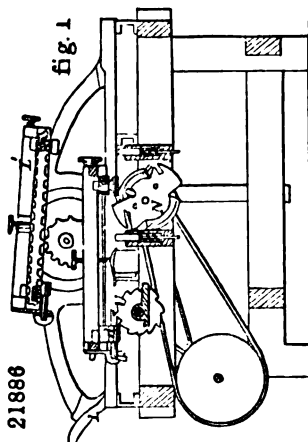
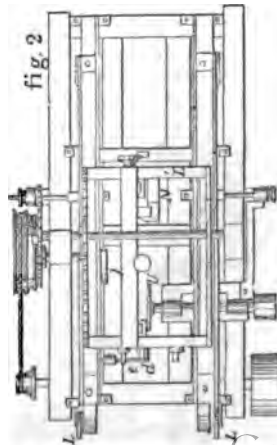
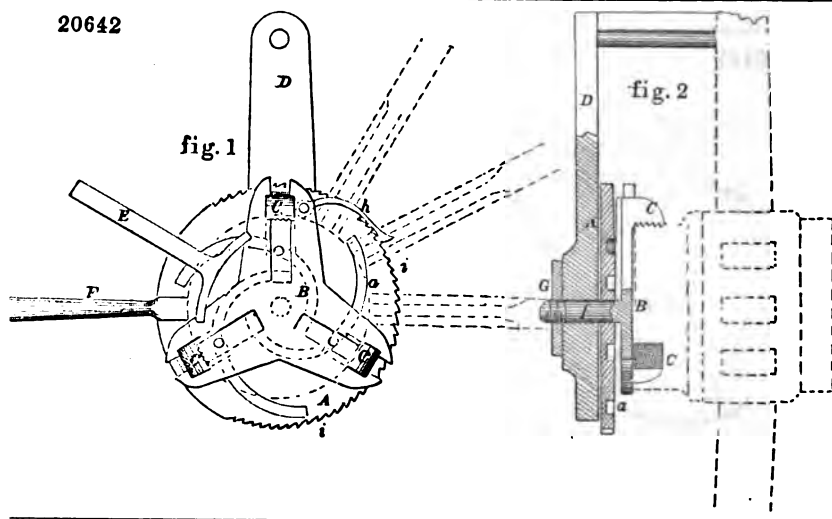


fig. 2



20642



21830

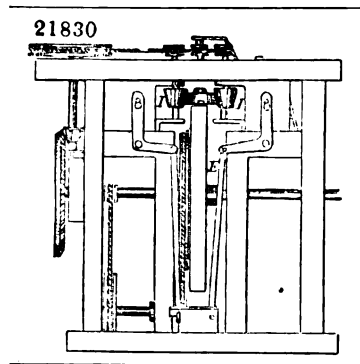
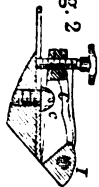
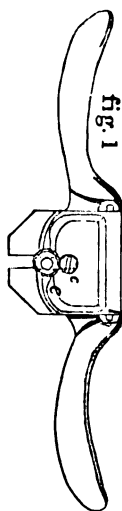


fig. 2

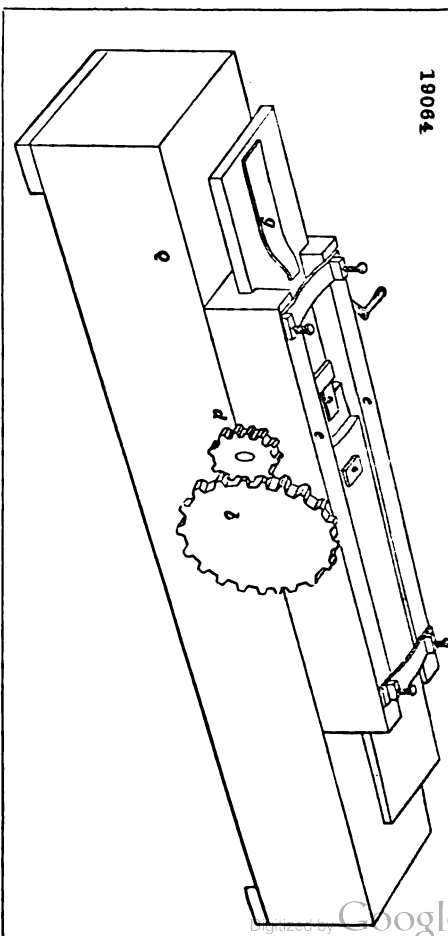


20855

fig. 1



18064



19444

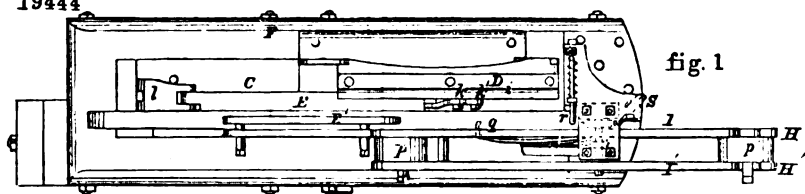


fig. 1

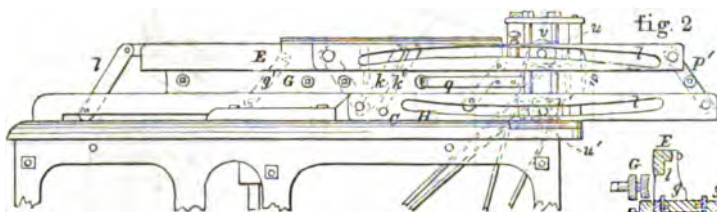
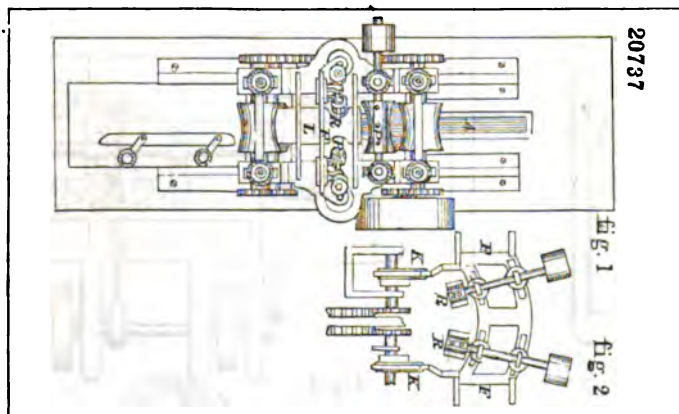
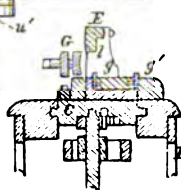


fig. 2

fig. 3



20737

fig. 1

fig. 2

19308

fig. 1

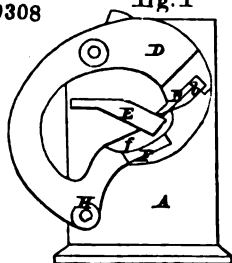


fig. 2

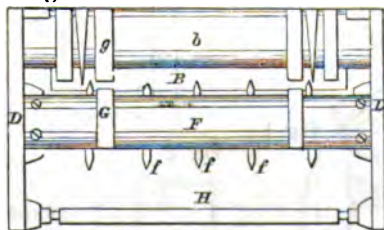
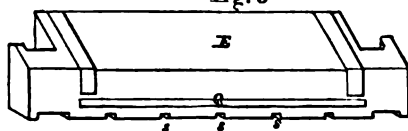
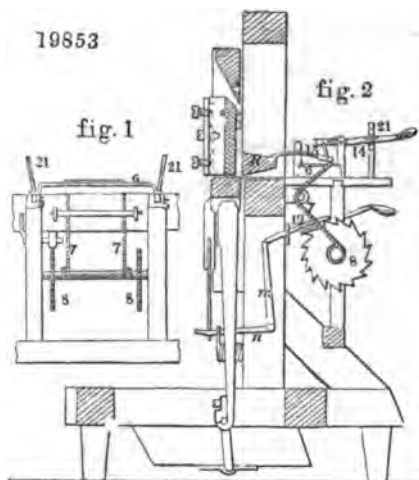


fig. 3





19853



21856

fig. 1

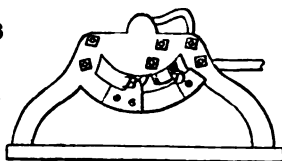
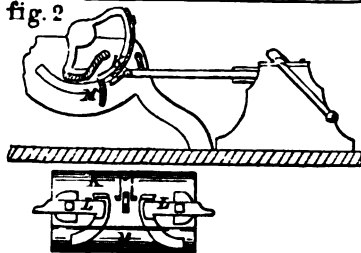
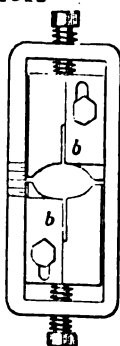


fig. 2



21512



19760

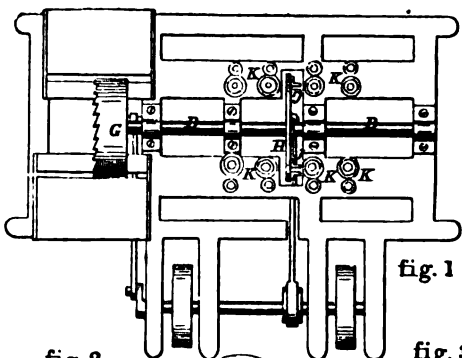


fig. 1

fig. 2

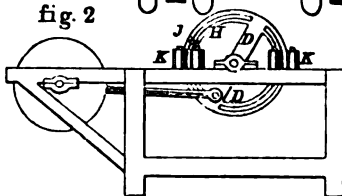


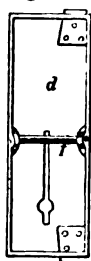
fig. 3



22231



fig. 2



19808

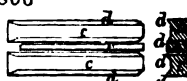


fig. 2

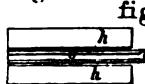
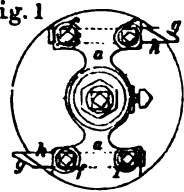
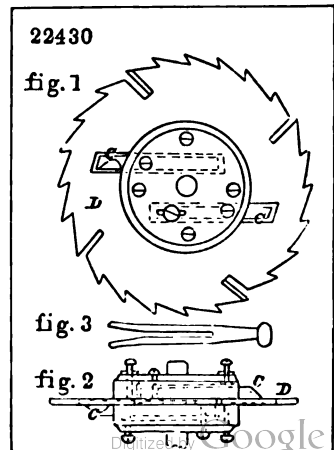
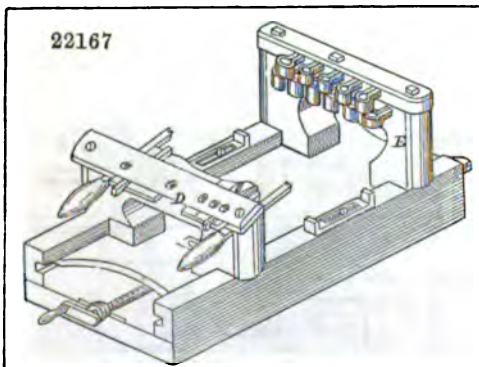
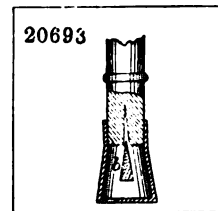
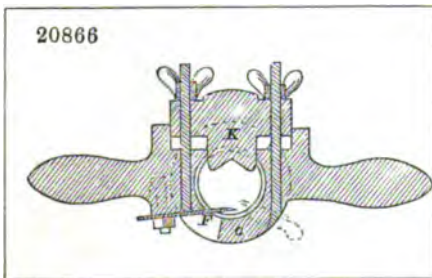
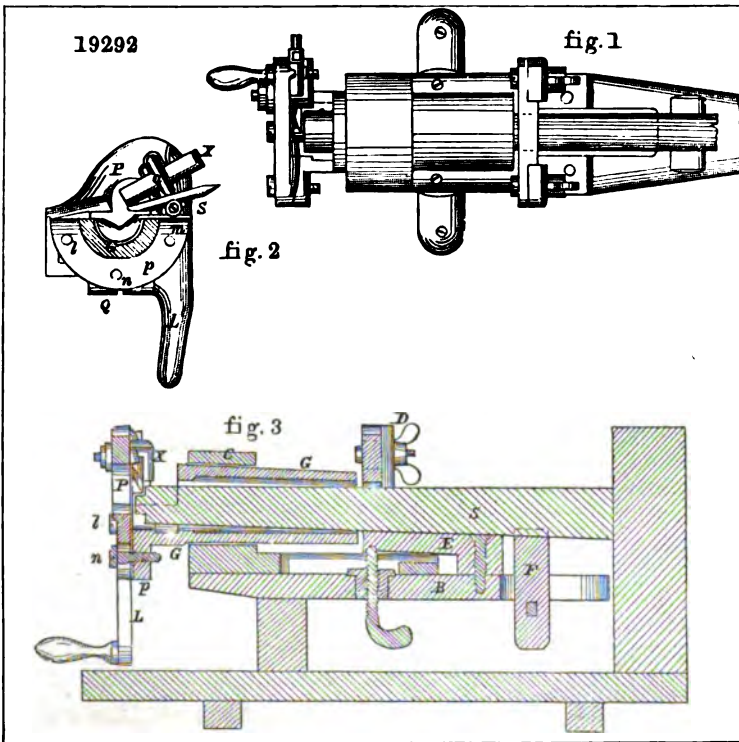


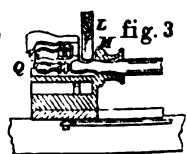
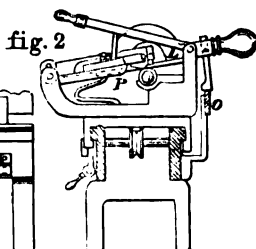
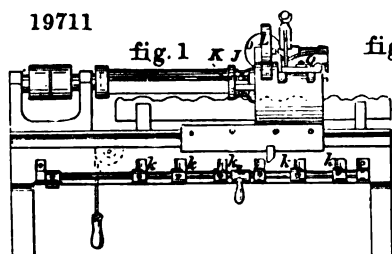
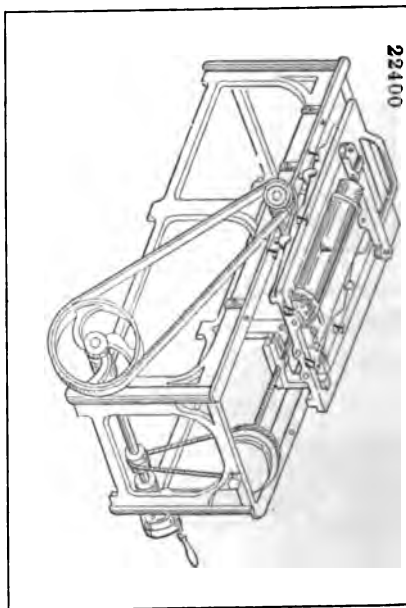
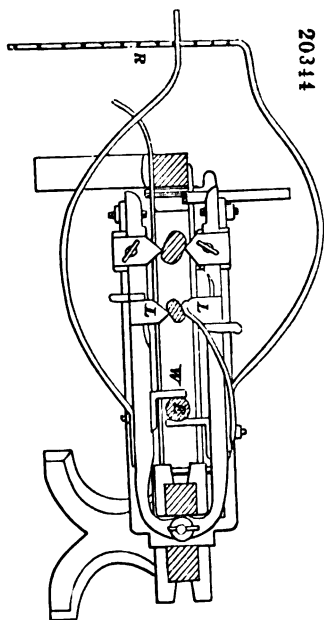
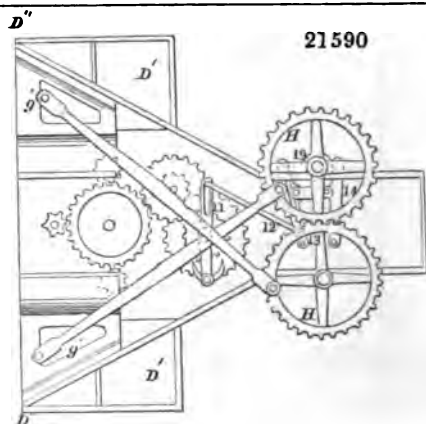
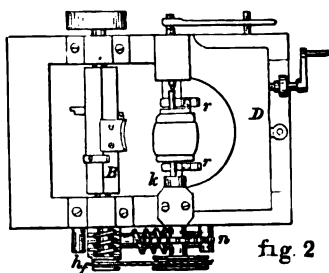
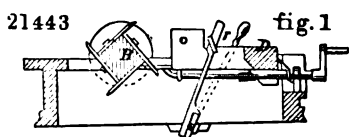
fig. 3

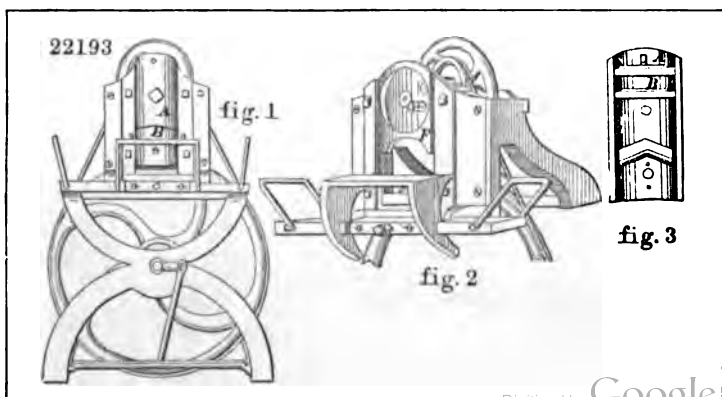
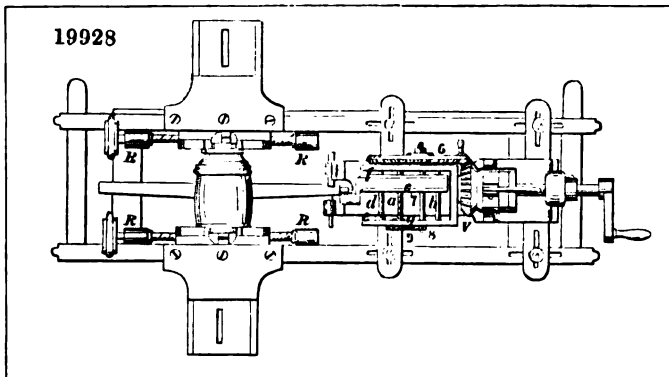
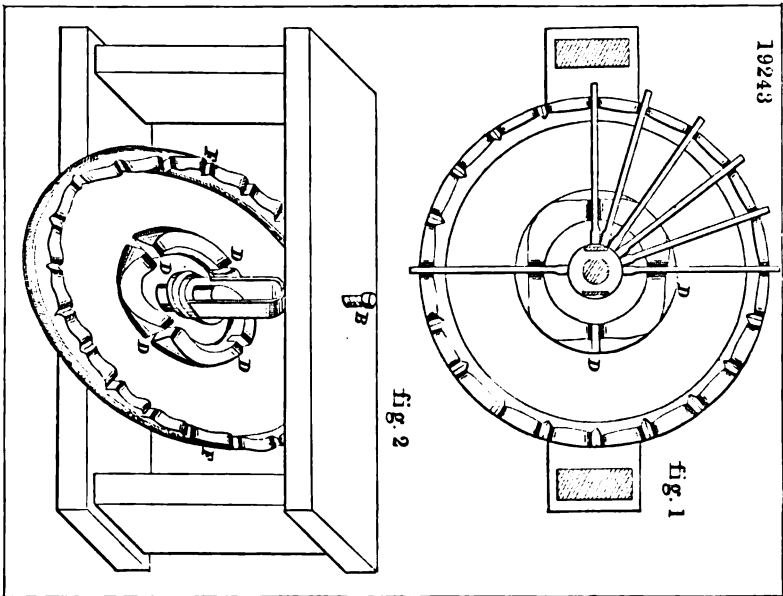


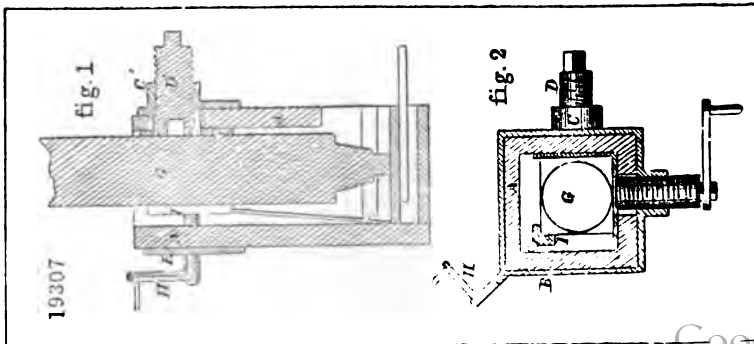
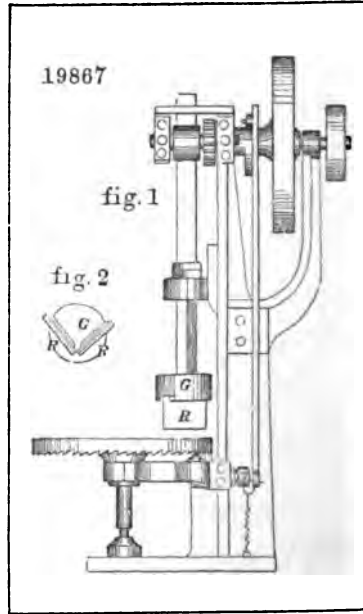
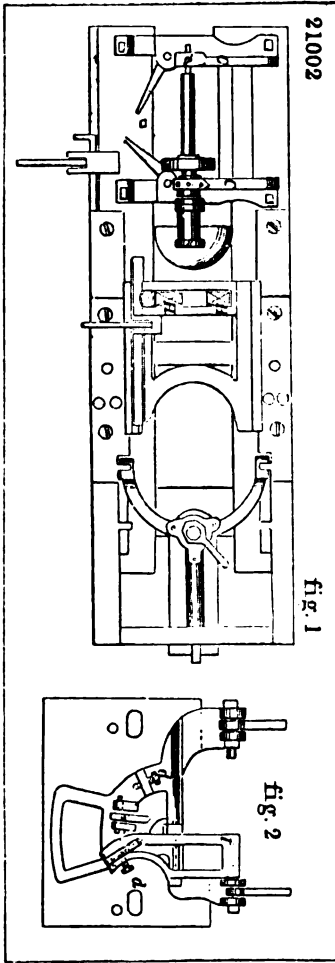
fig. 1



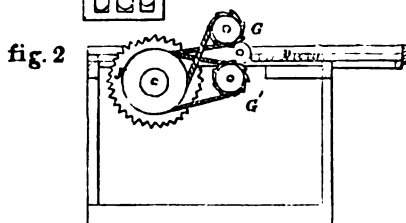
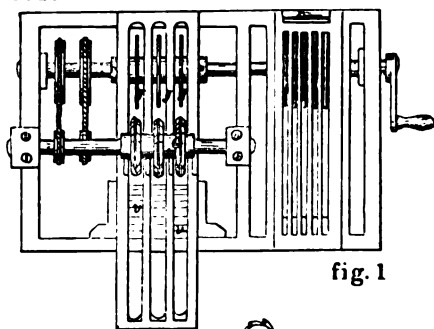




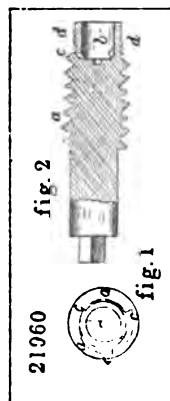
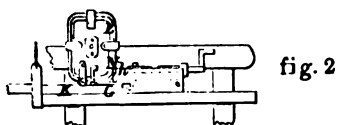
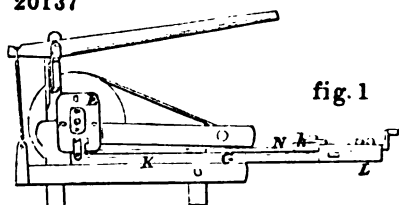




## 20016



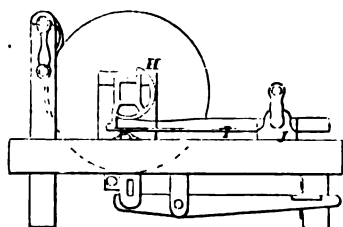
20137



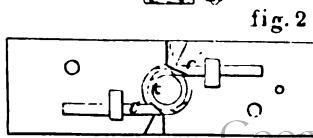
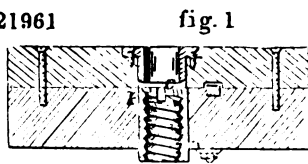
21960



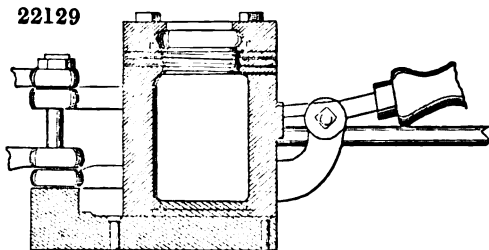
19538



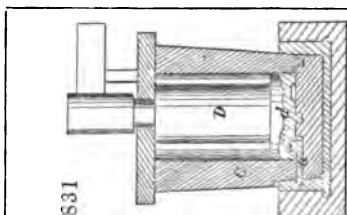
21961



22129



21831



20146

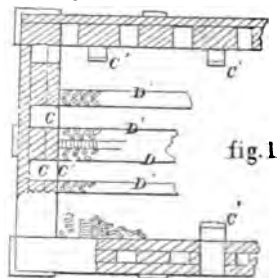
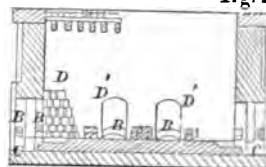


fig. 1

fig. 2



19236

fig. 1

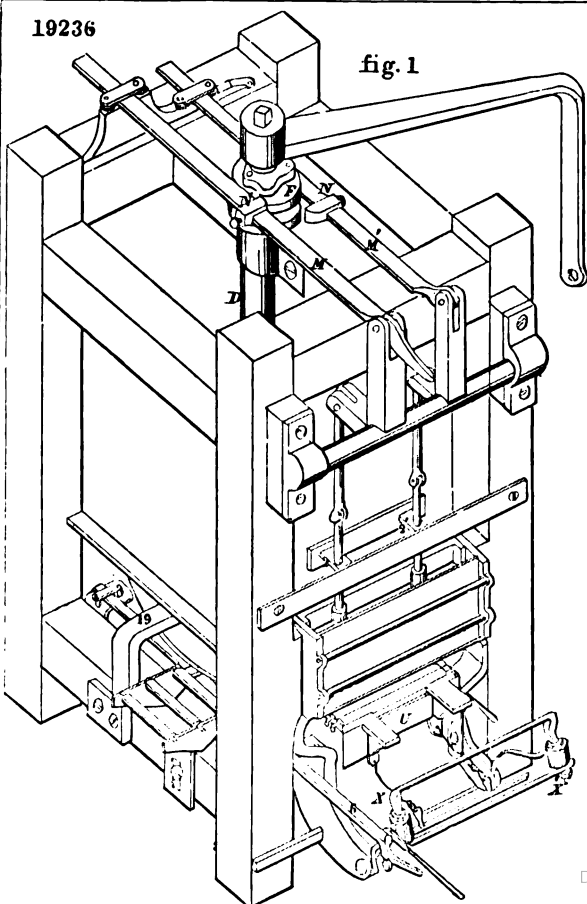


fig. 2



19366

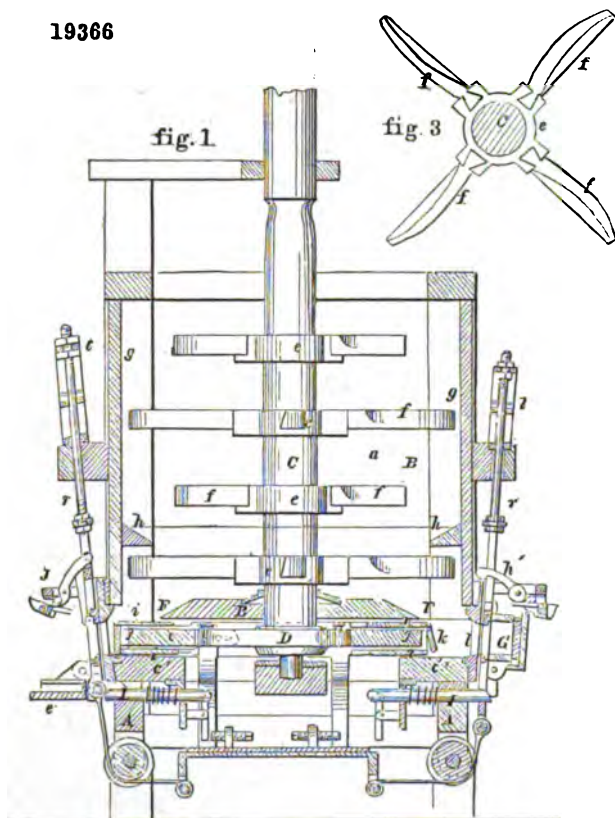
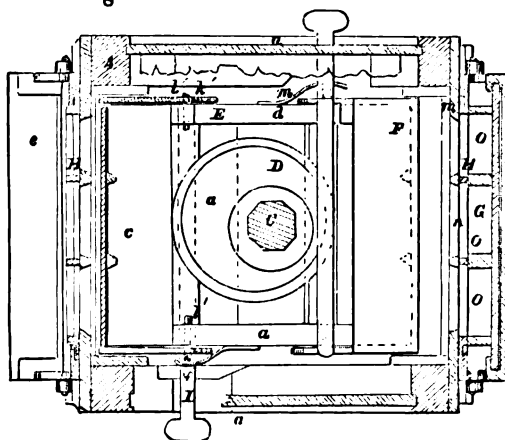
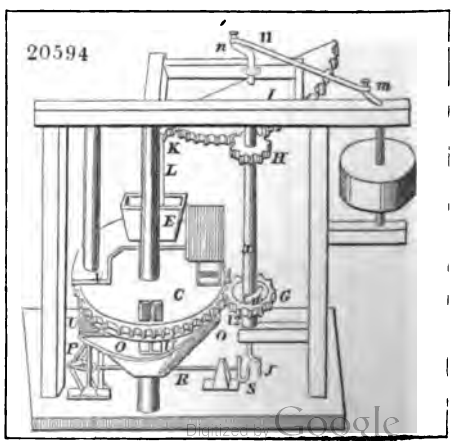
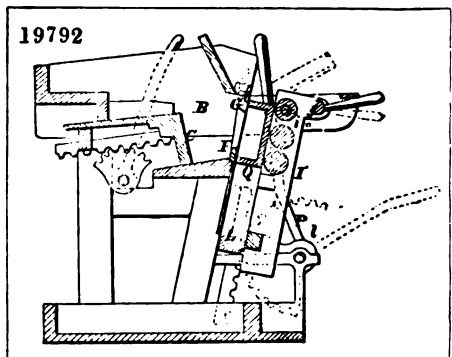
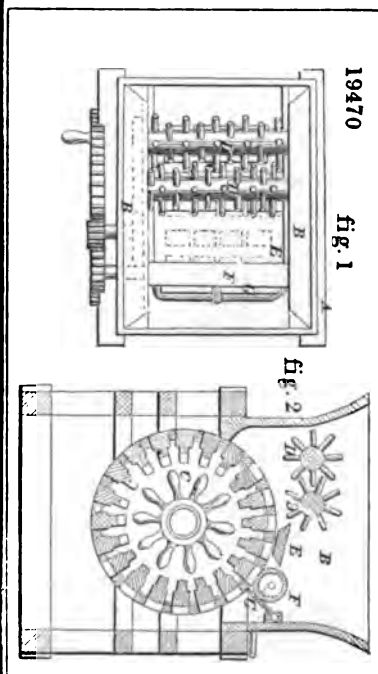
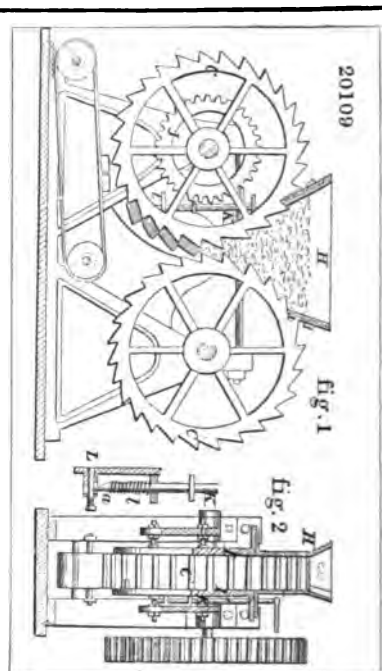
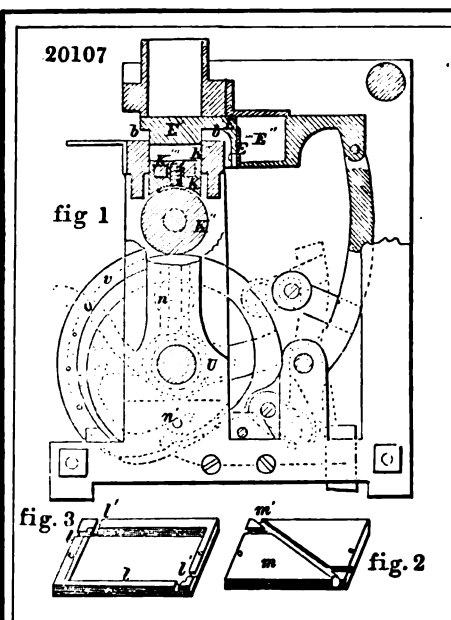
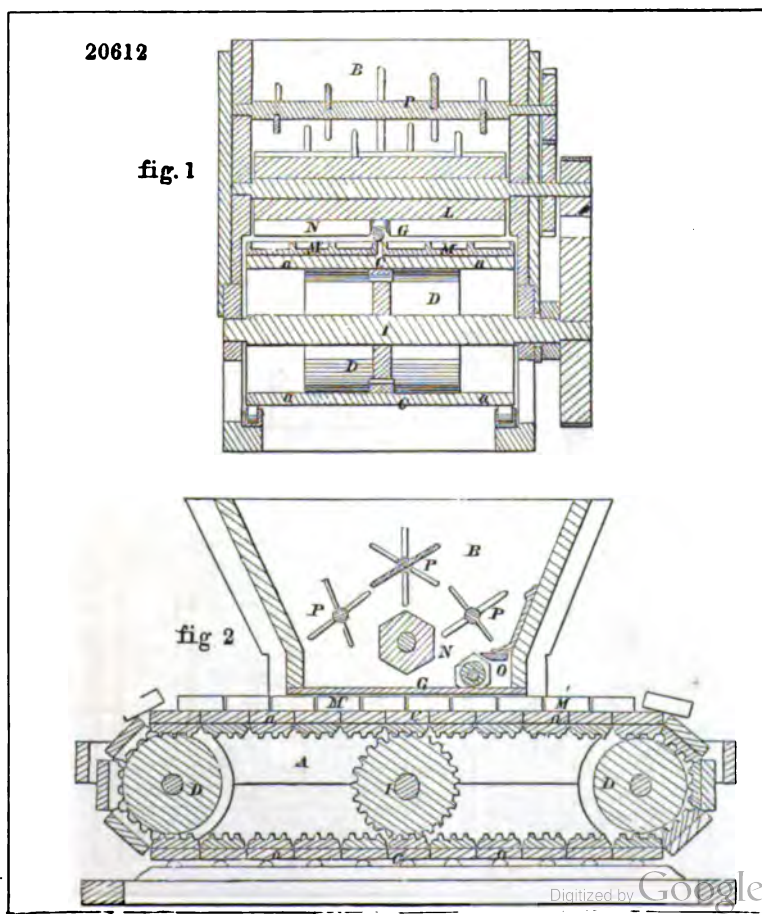
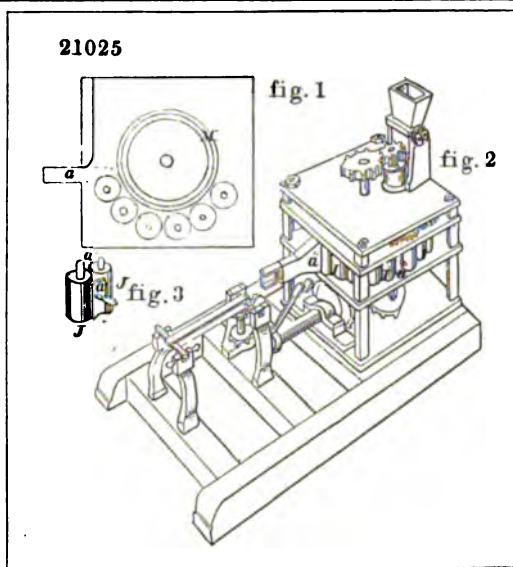
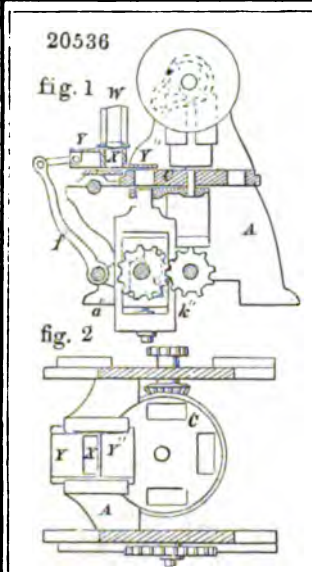


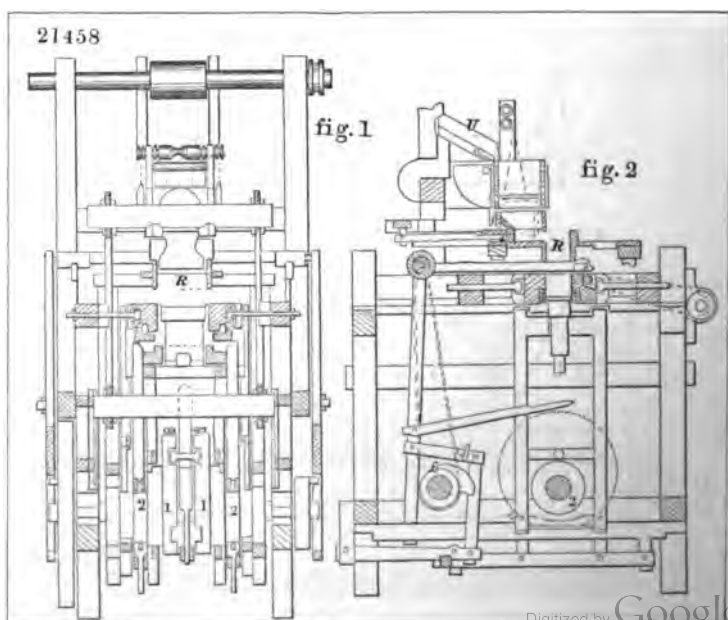
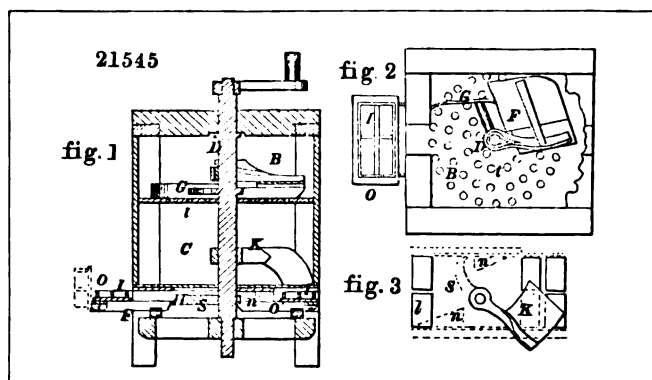
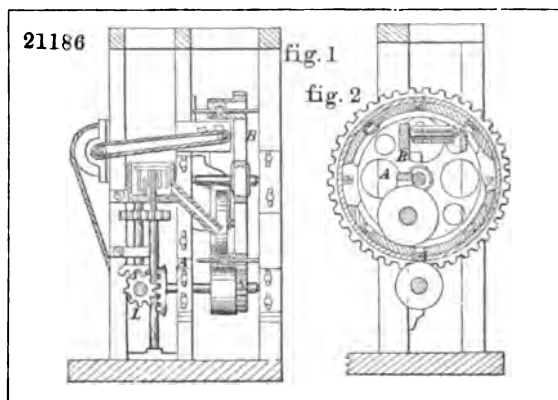
fig. 2

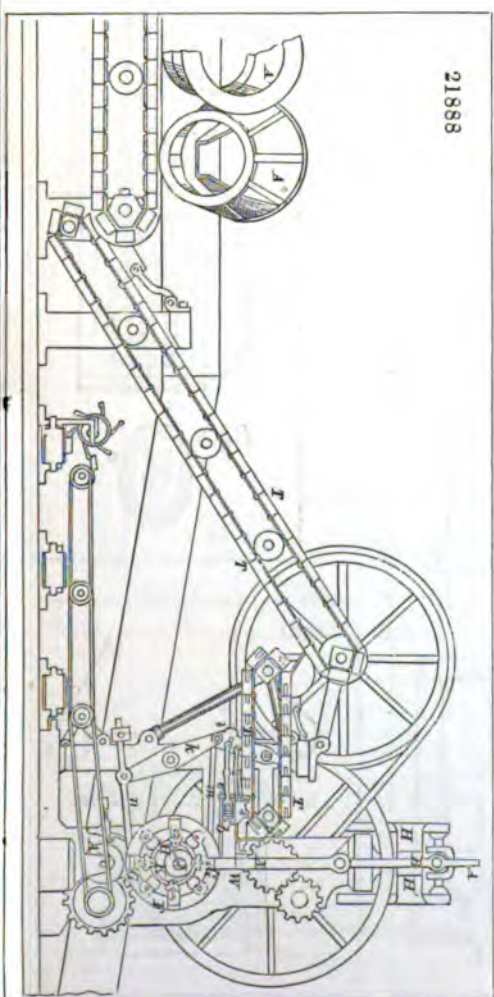
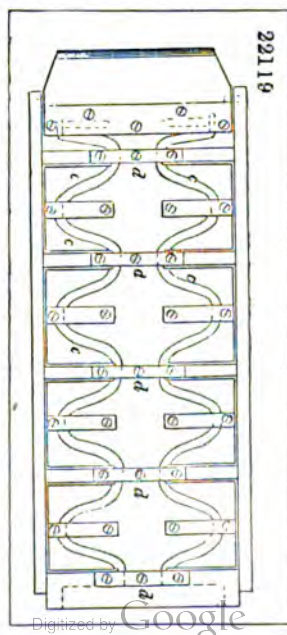
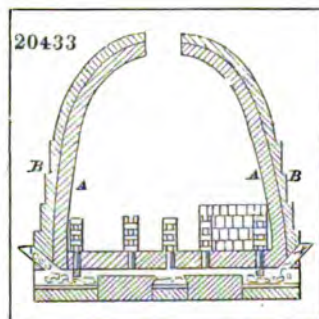
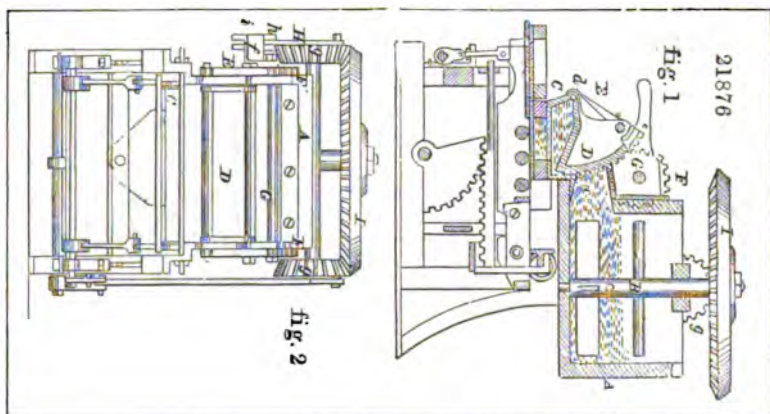












19309

fig. 1

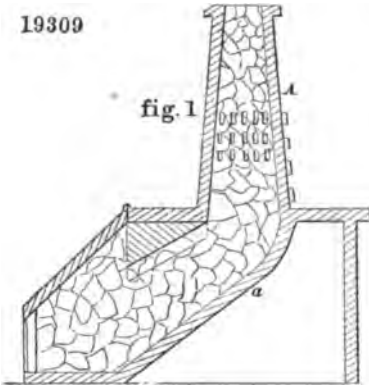
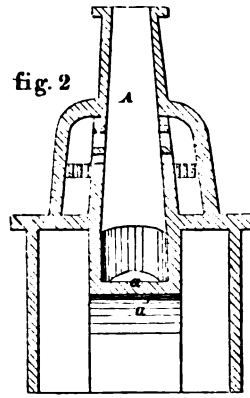
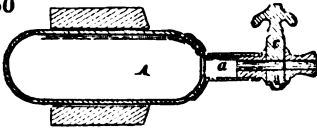


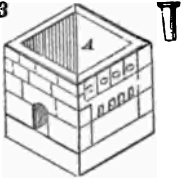
fig. 2



22450



22393



21419

fig. 1

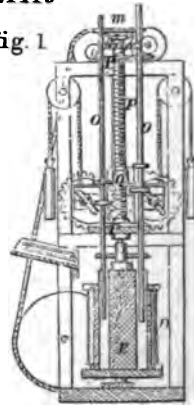


fig. 2



21506

fig. 1

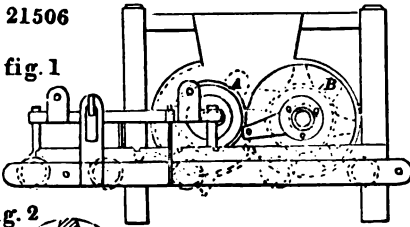


fig. 2



fig. 3

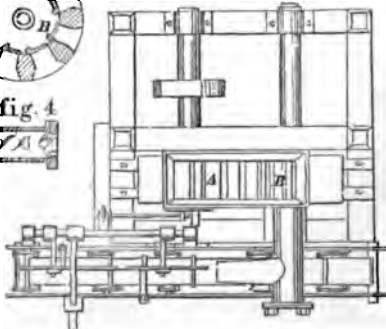
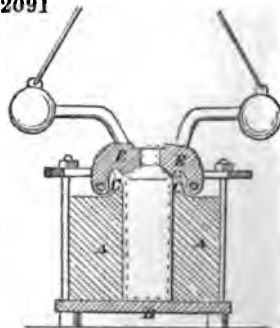


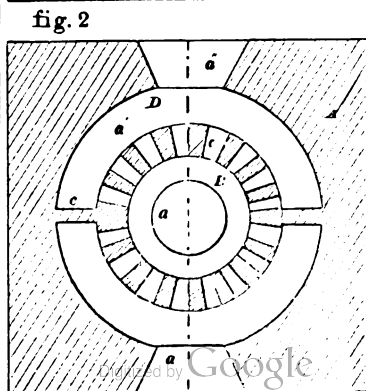
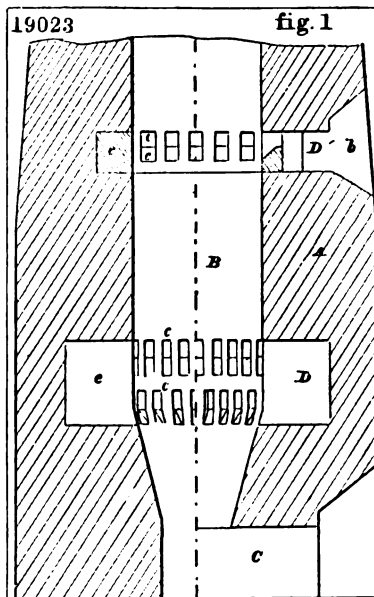
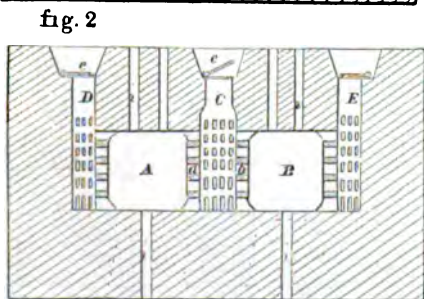
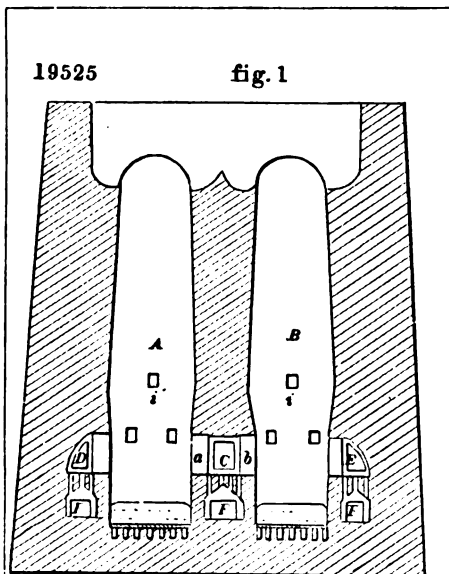
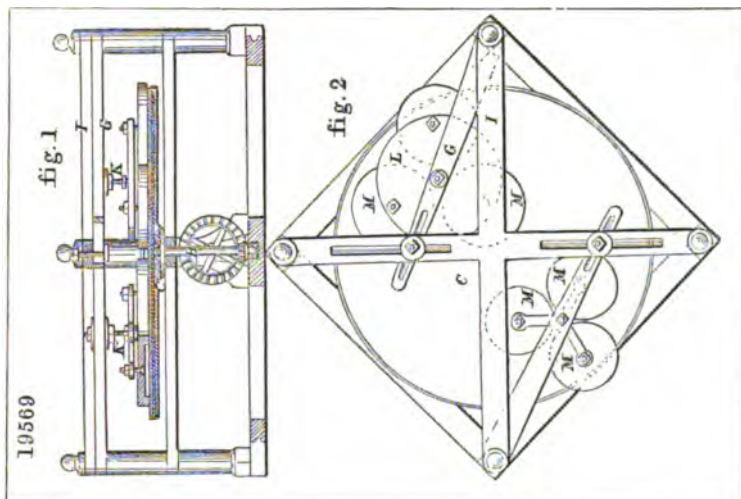
fig. 4

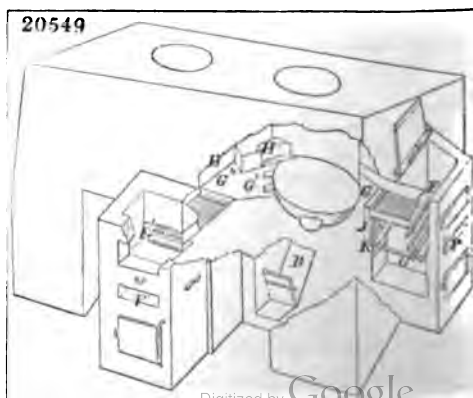
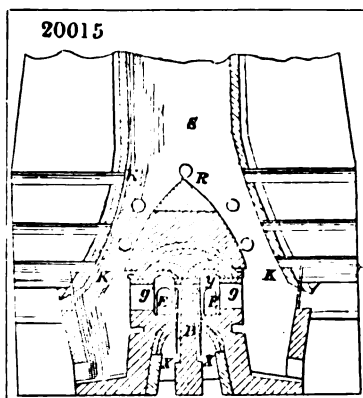
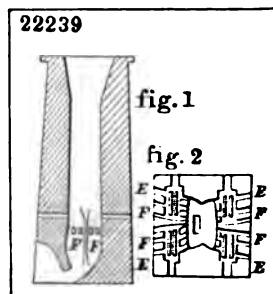
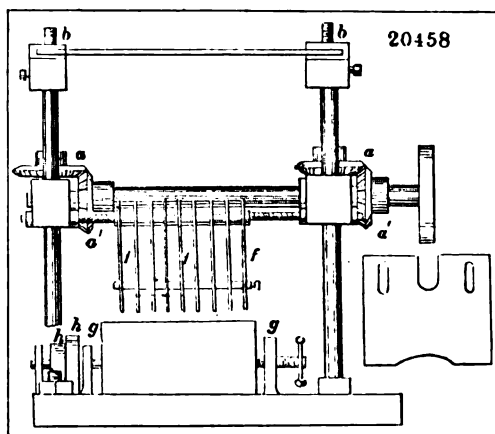
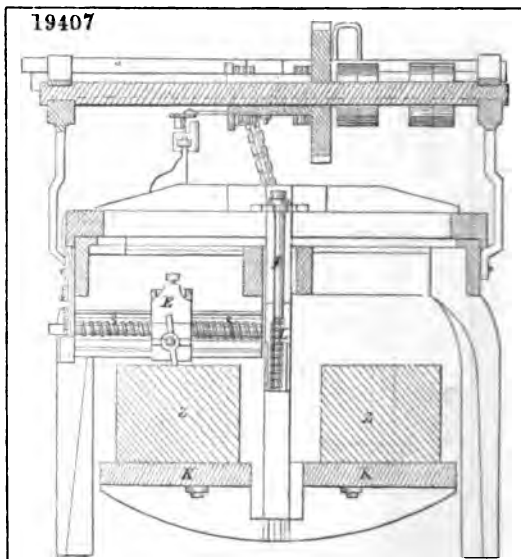
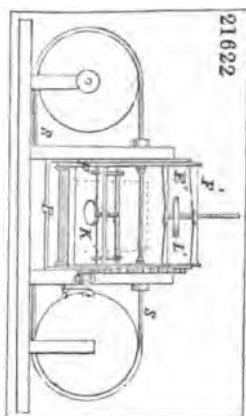


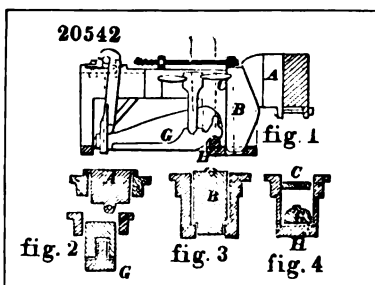
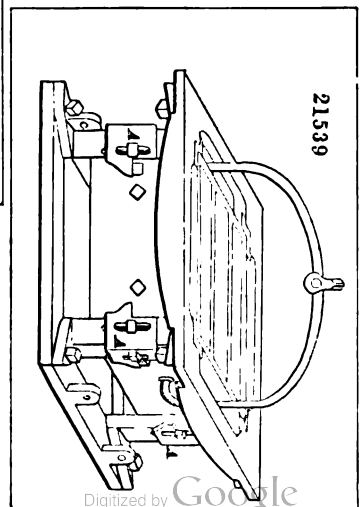
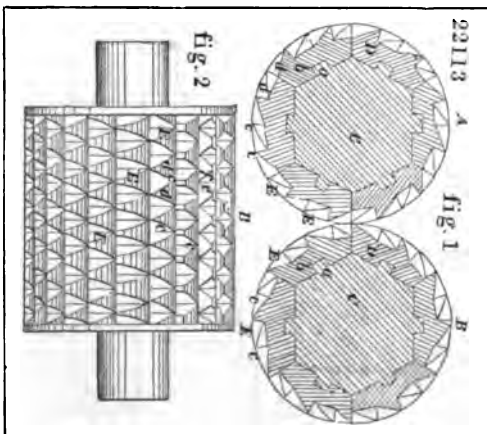
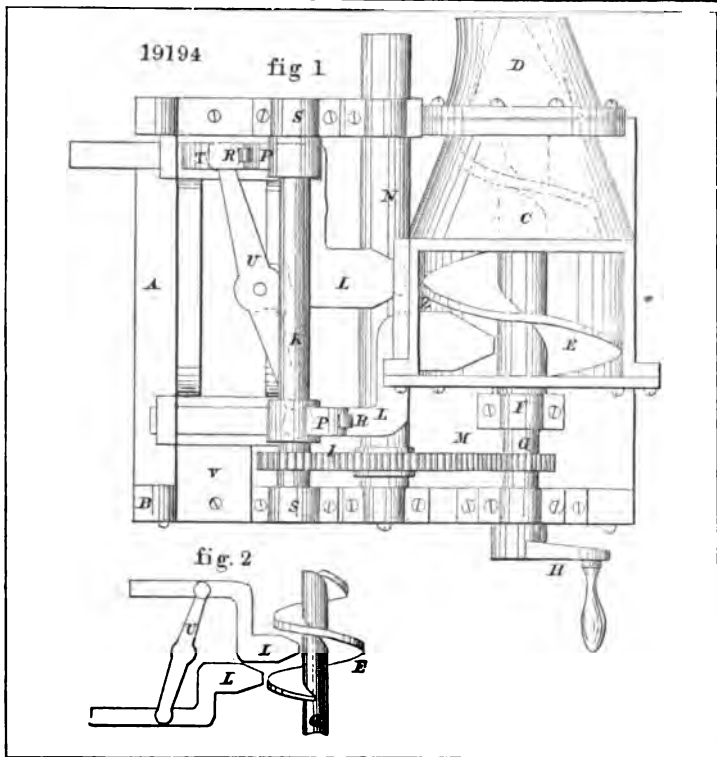
22091



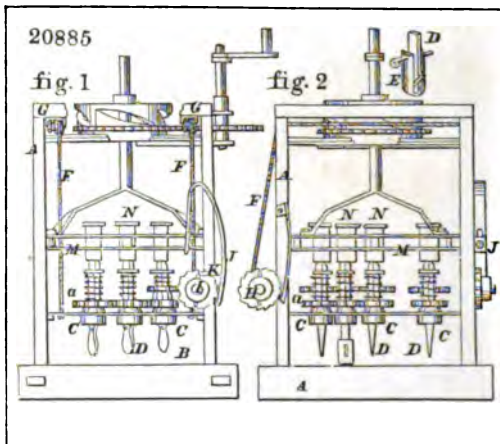
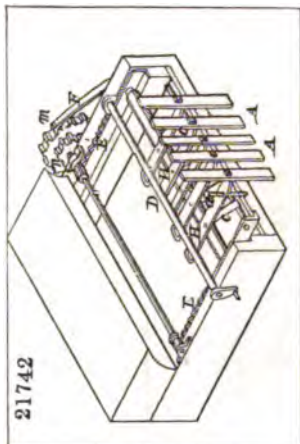












20981

fig. 1

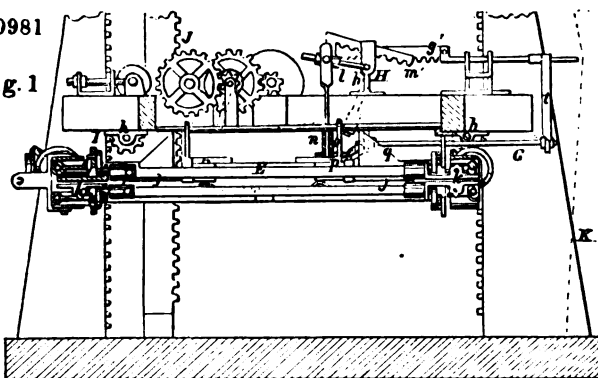
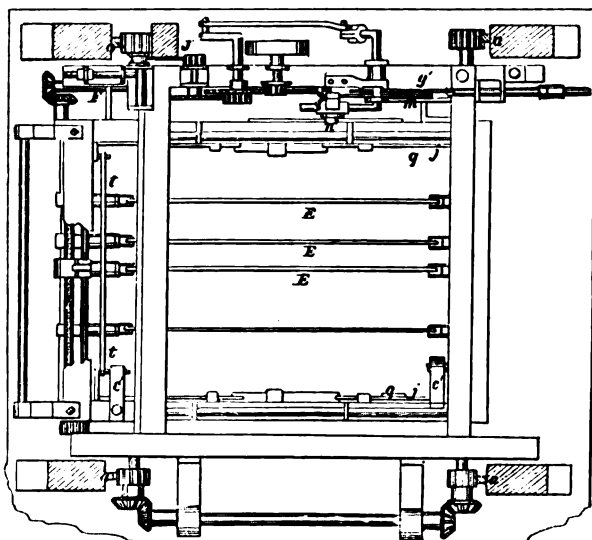
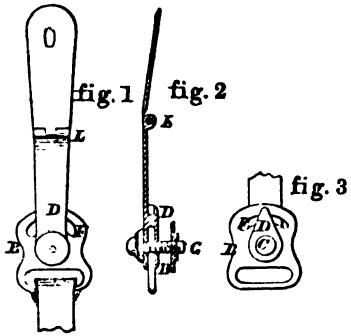


fig. 2



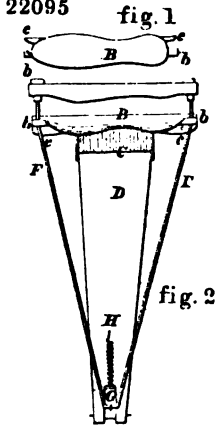
20434



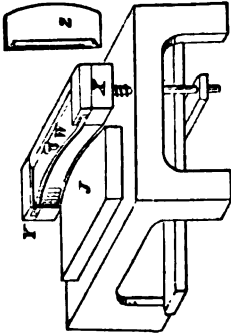
22102



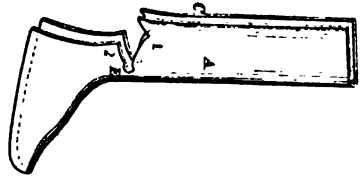
22095



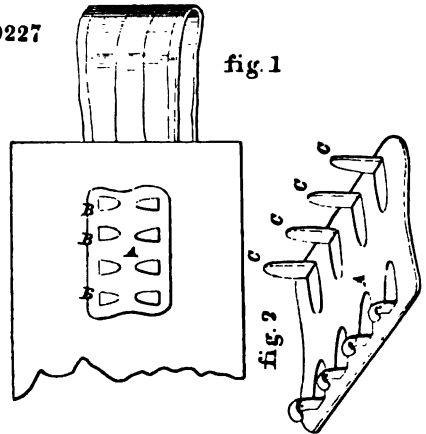
19912



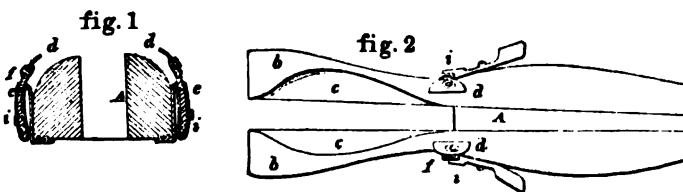
20932



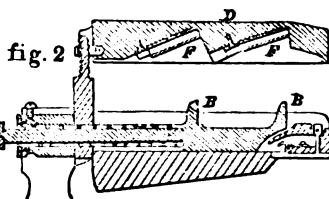
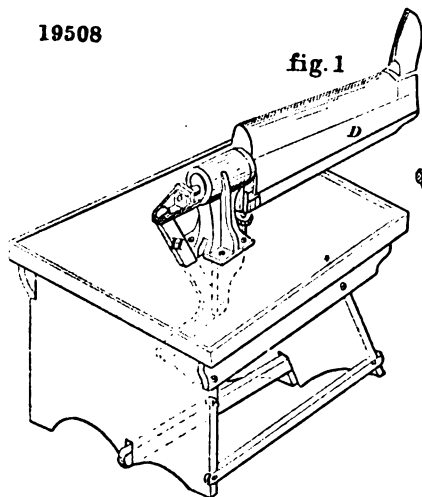
19227



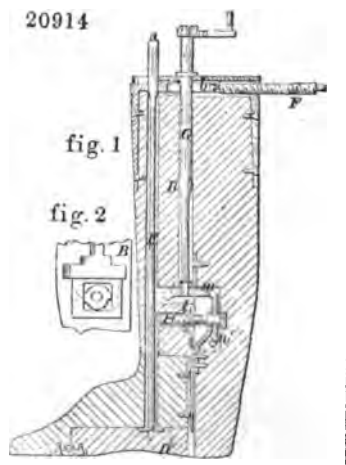
22205



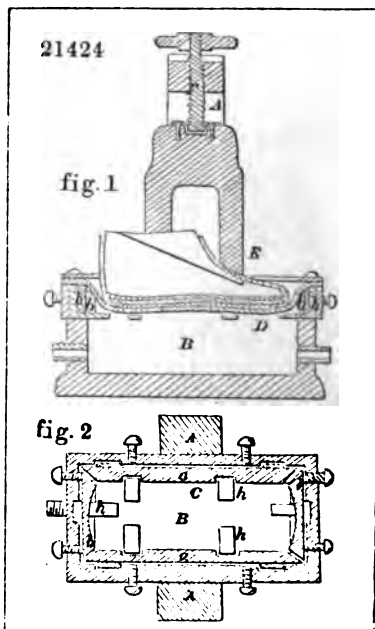
19508



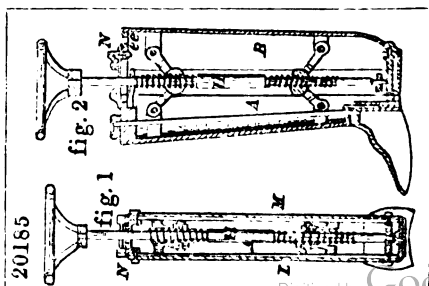
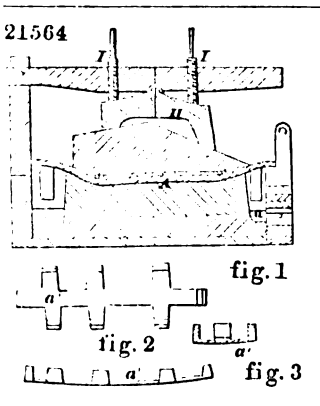
20914

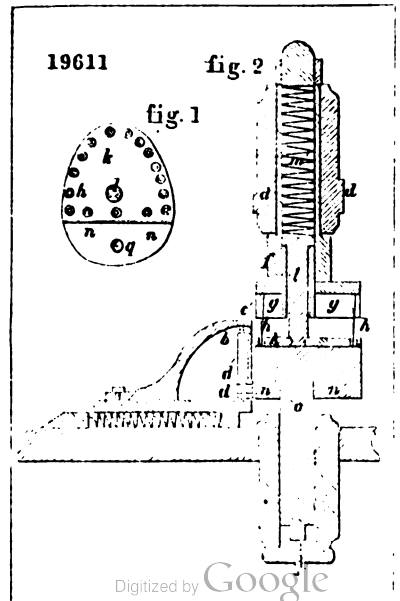
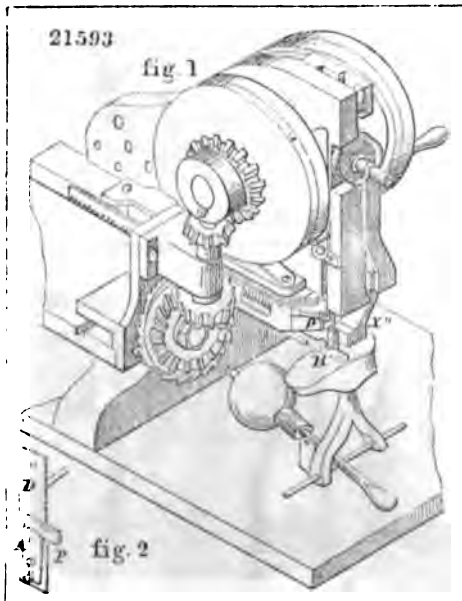
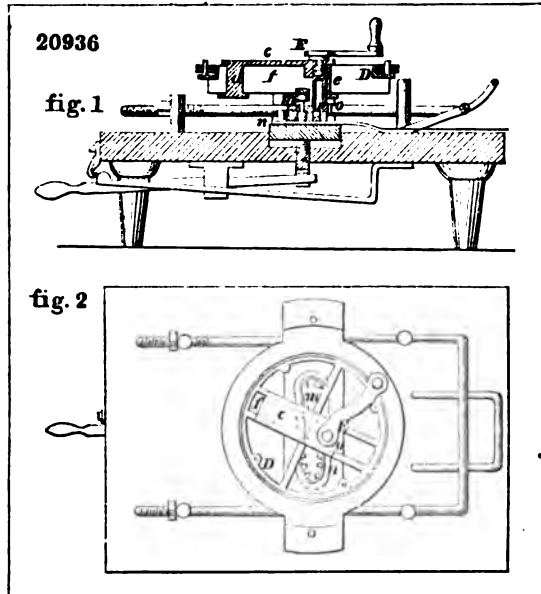
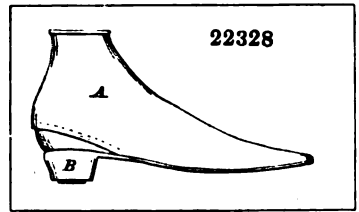
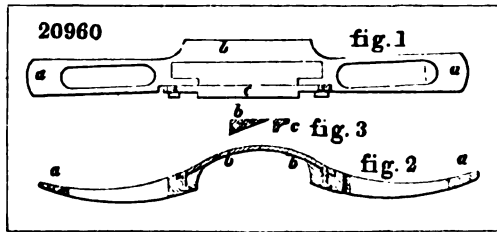


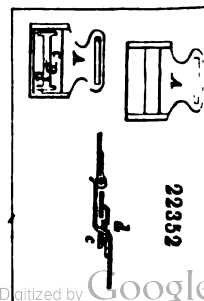
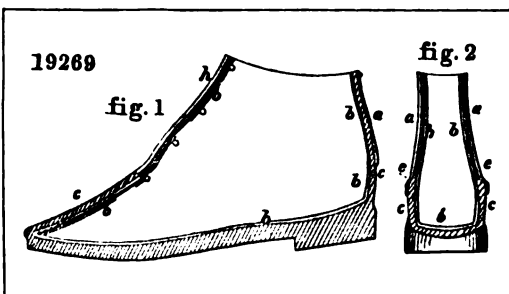
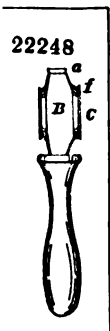
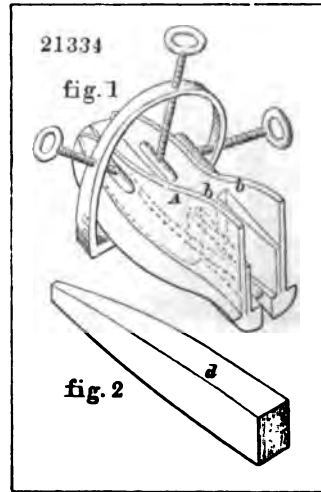
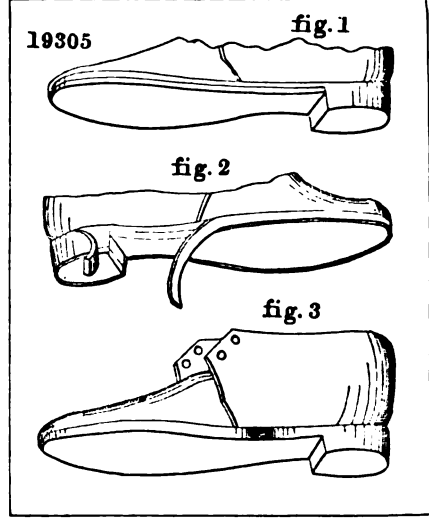
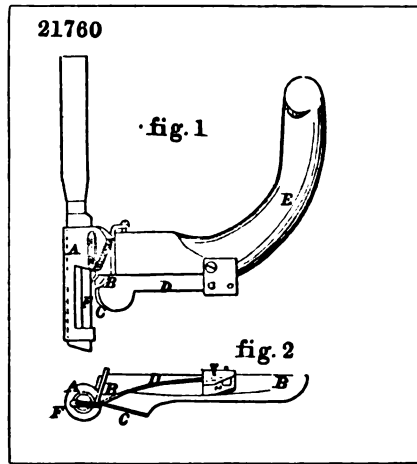
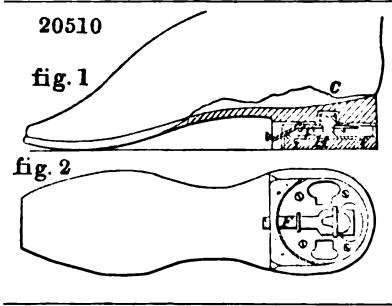
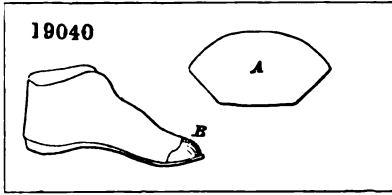
21424



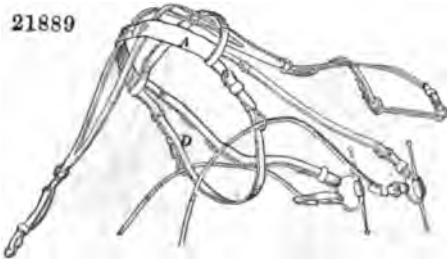
21564



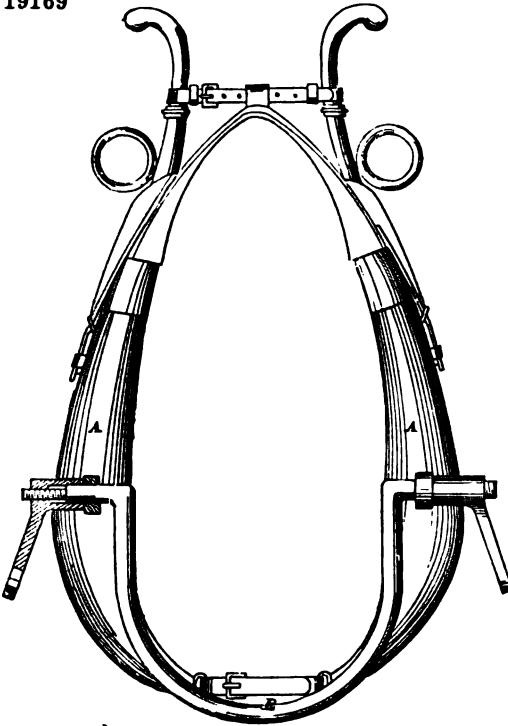




21889



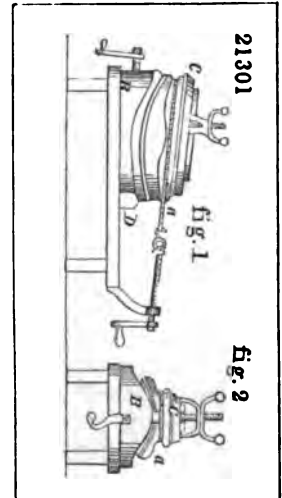
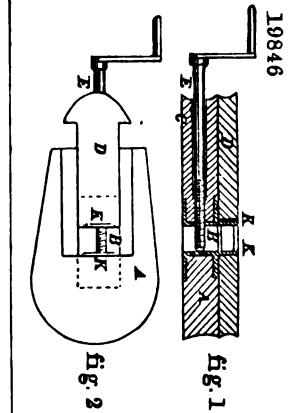
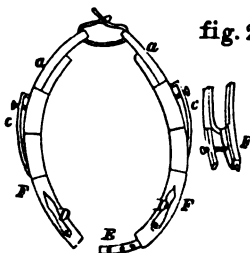
19169



21821

fig. 1

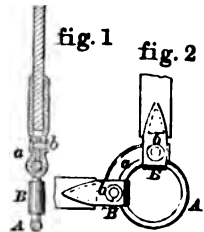
fig. 2



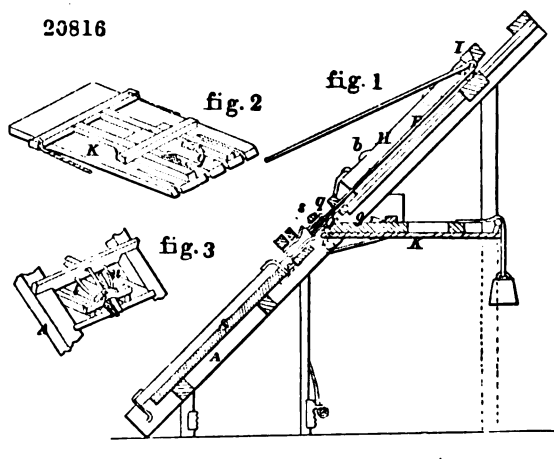
21674

fig. 1

fig. 2



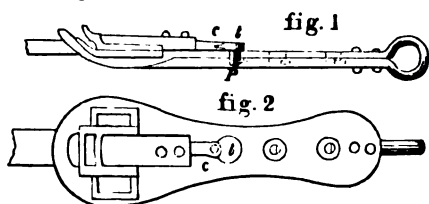
20816



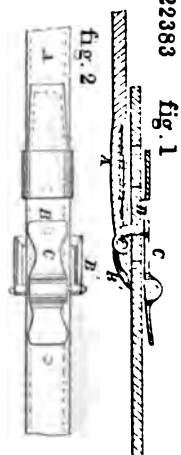
22096



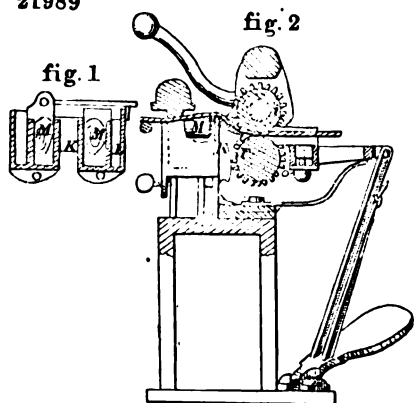
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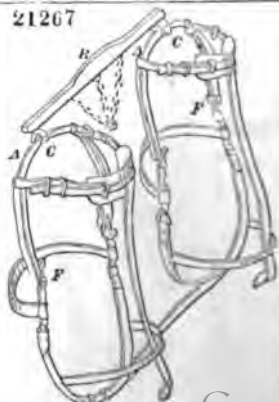
22383



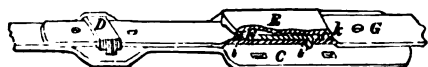
21989



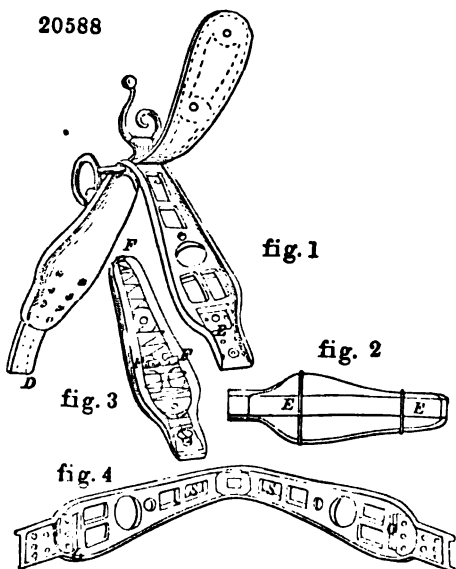
21267



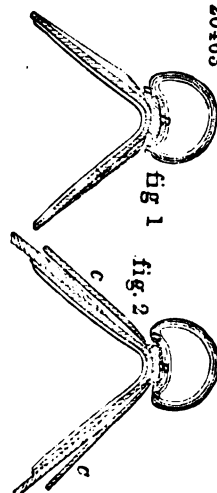
20246



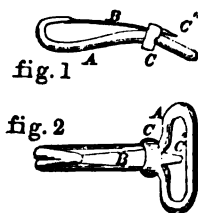
20588



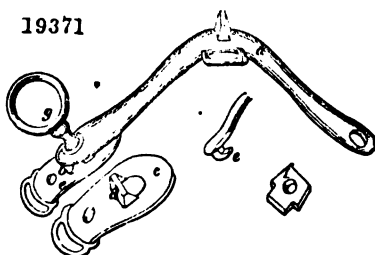
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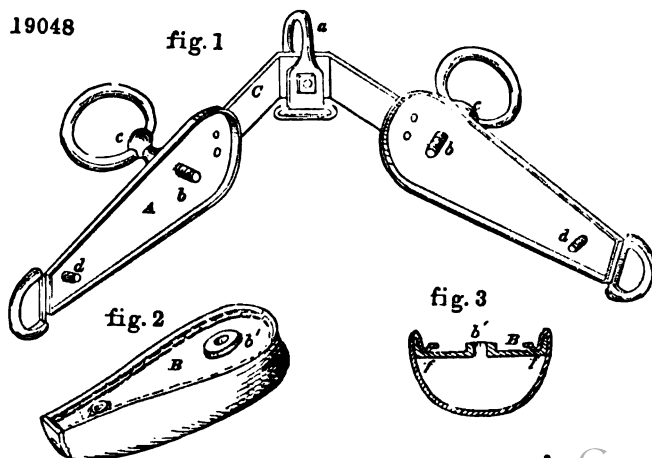
22290



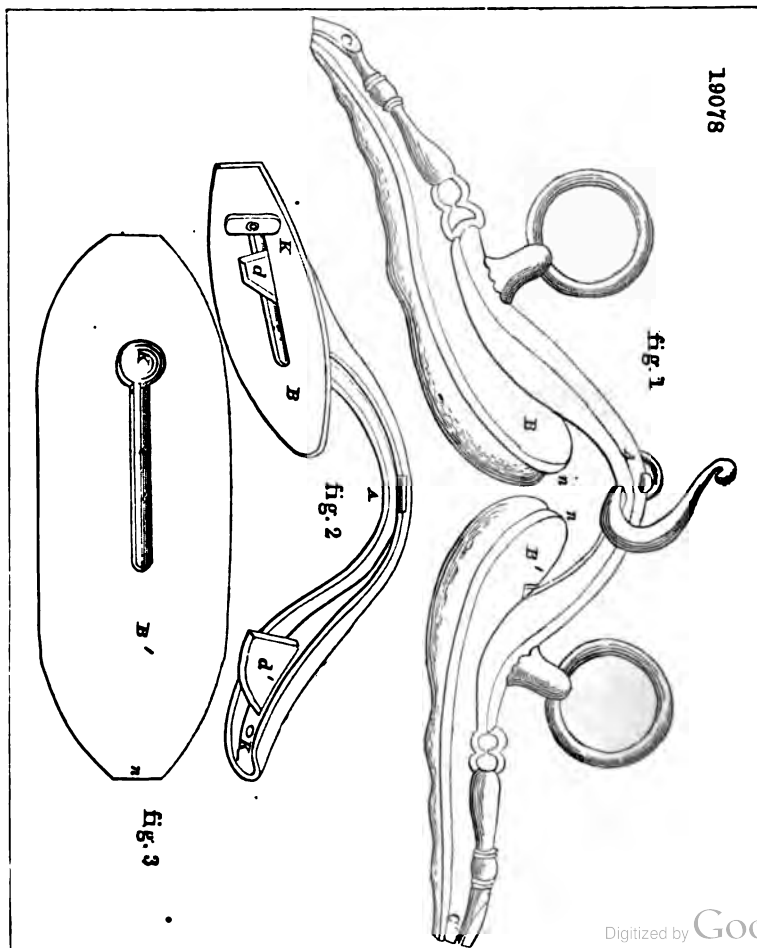
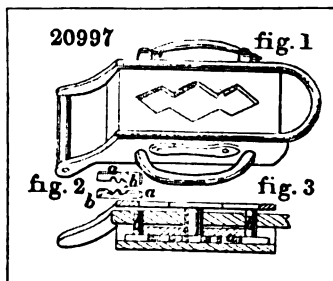
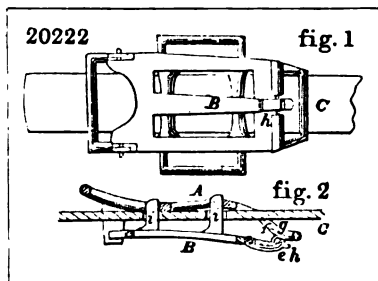
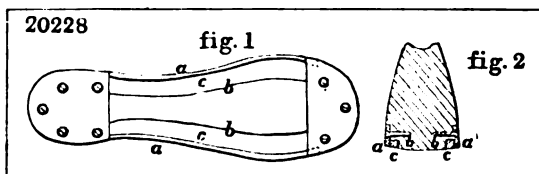
19371



19048







20861

fig. 1

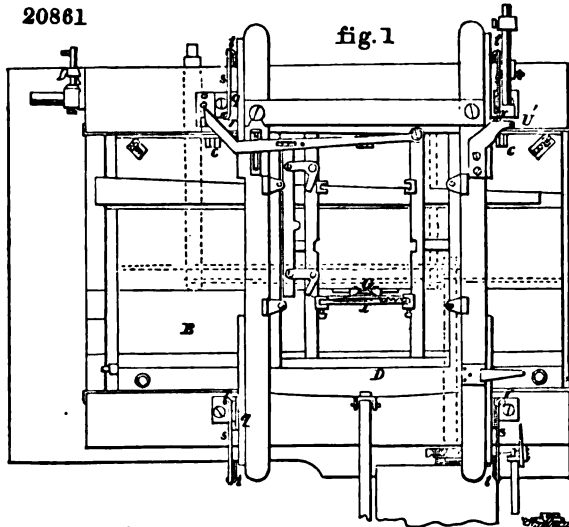


fig. 2

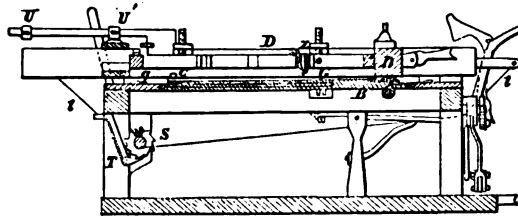
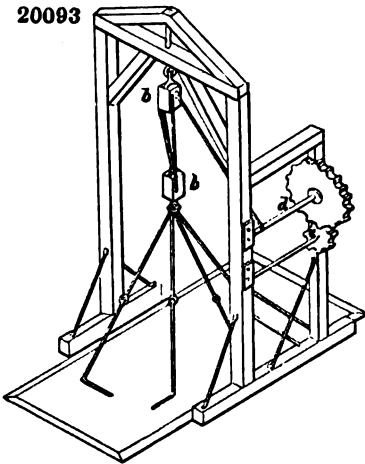


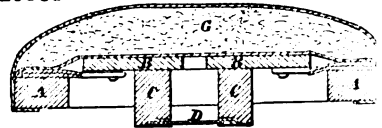
fig. 3



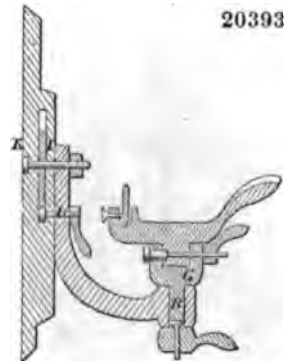
20093

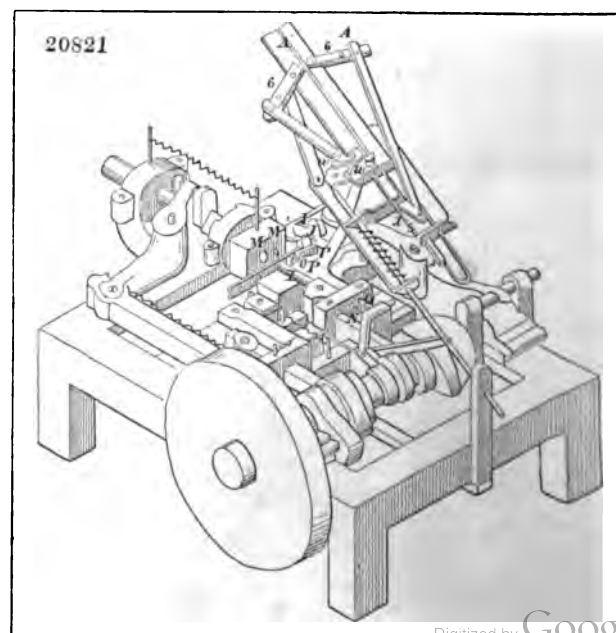
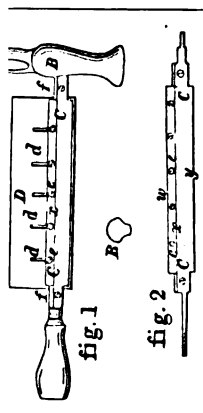
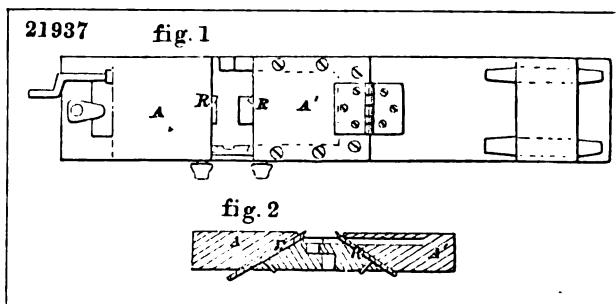
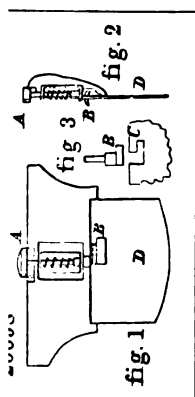
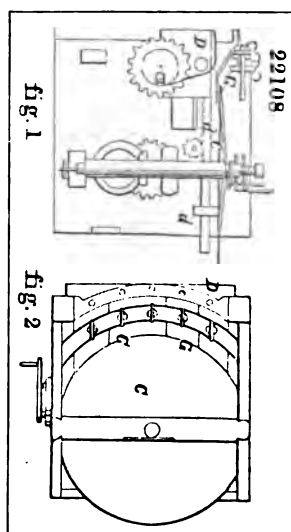
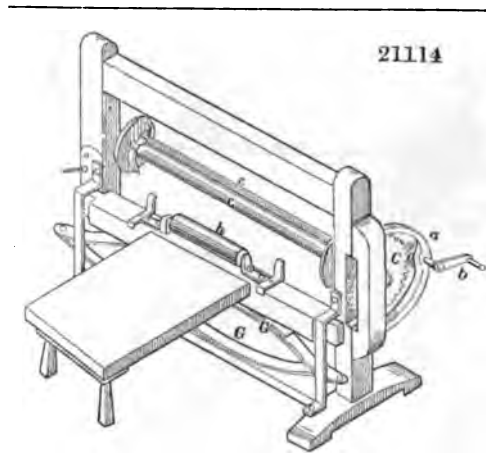


19583

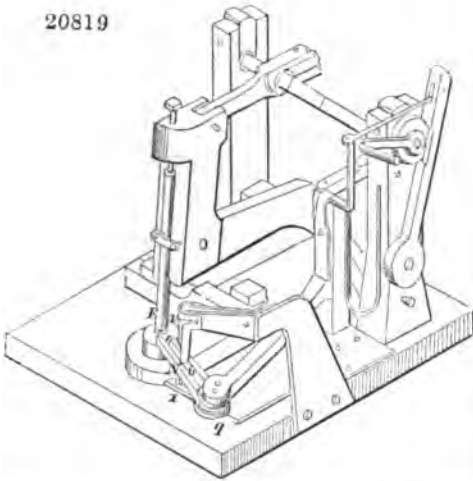


20393





20819



21091

fig. 1

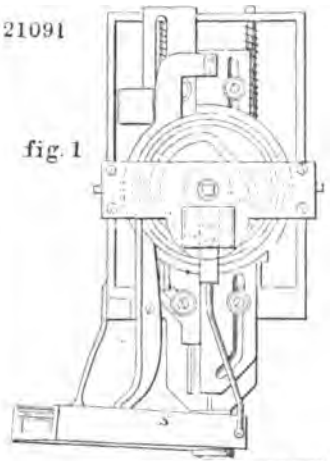


fig. 2

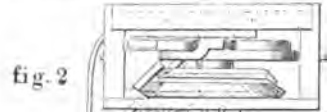
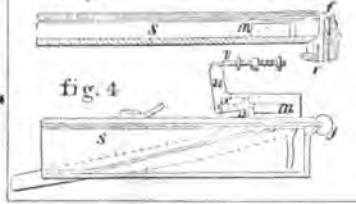


fig. 3



fig. 4



22340

fig. 3

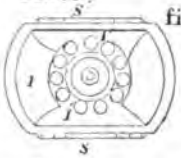


fig. 2

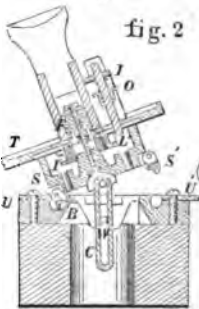
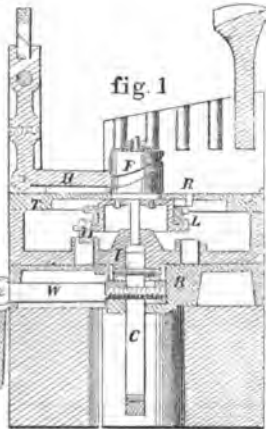


fig. 1



19354

fig. 1

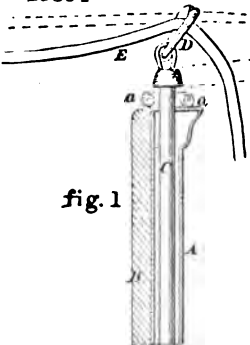


fig. 2

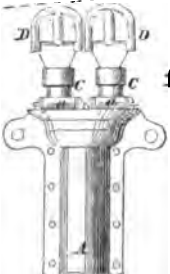


fig. 1

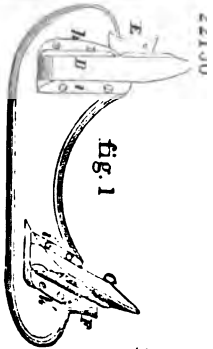
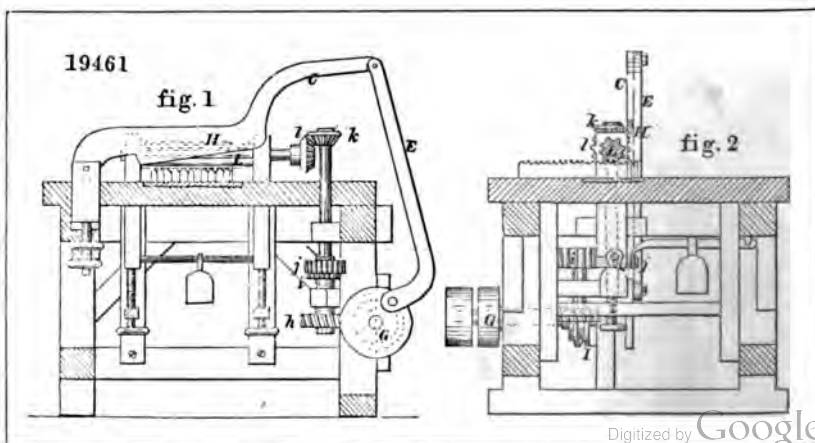
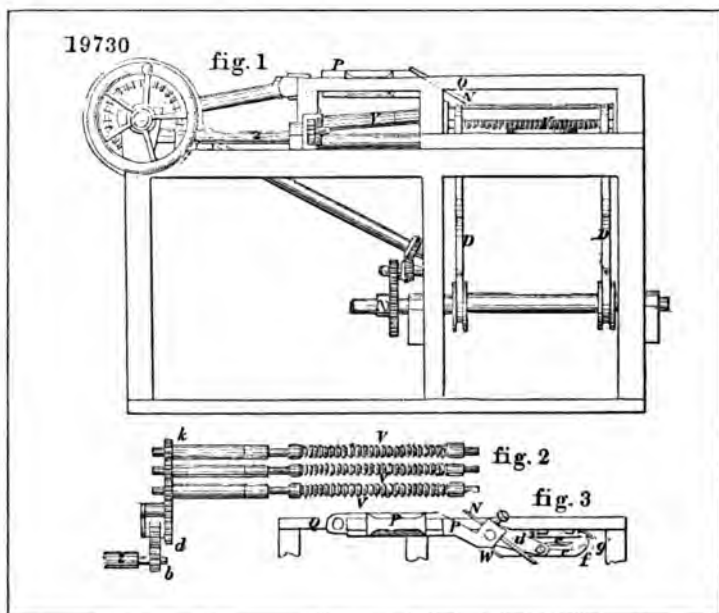
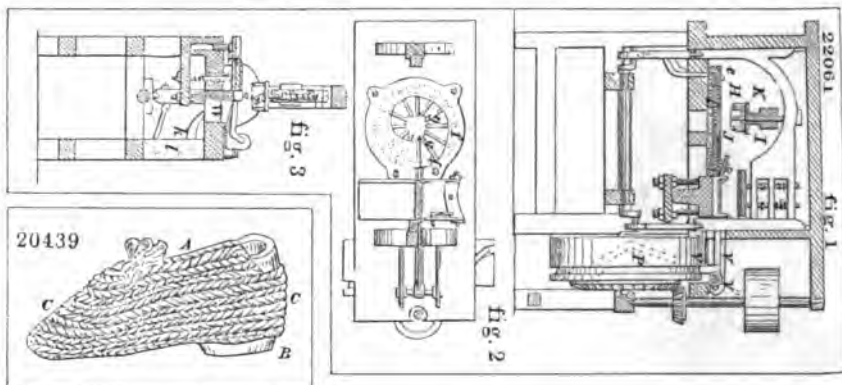
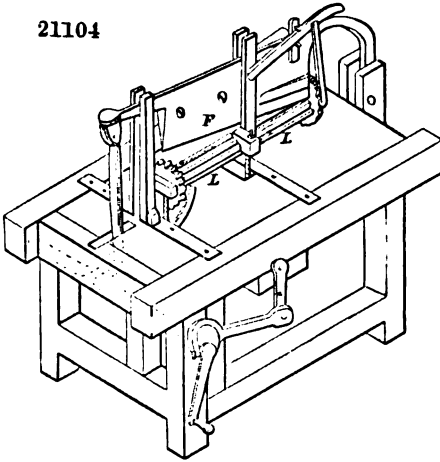


fig. 2





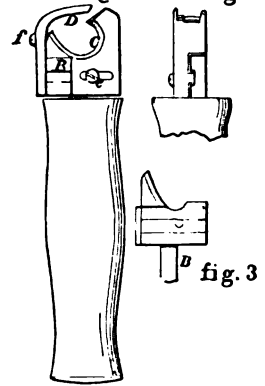
21104



20682

fig. 1

fig. 2



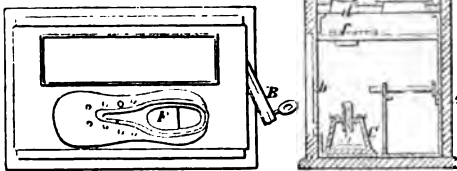
21223



21500

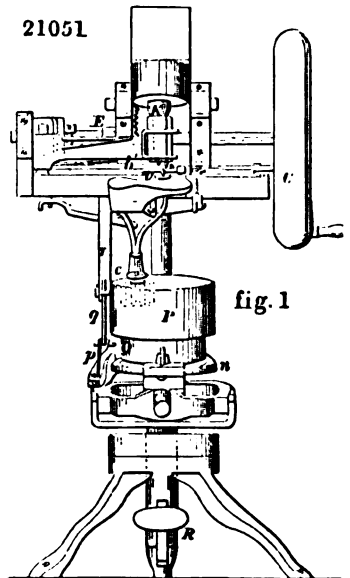
fig. 1

fig. 2



21051

fig. 1



19282

fig. 1

fig. 2

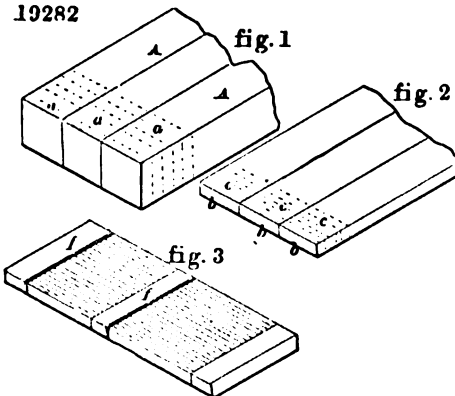
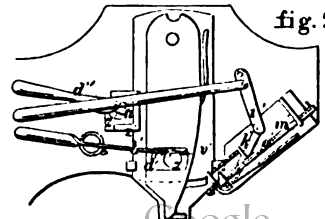
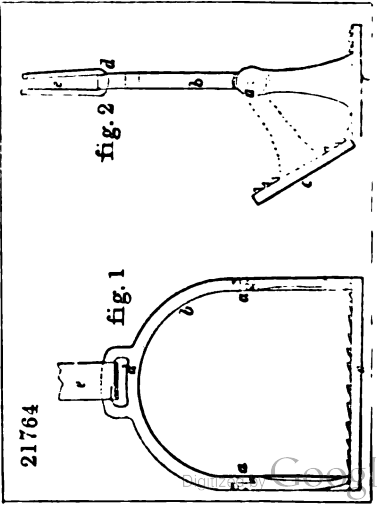
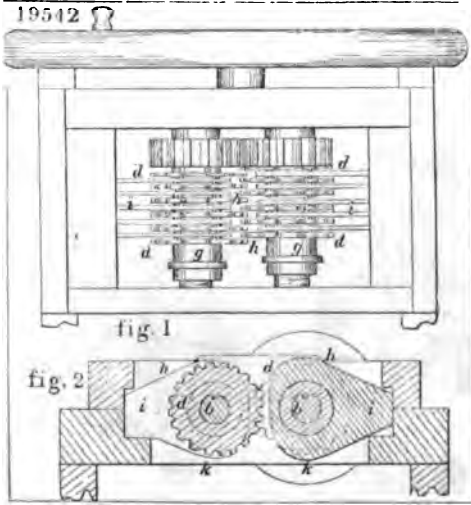
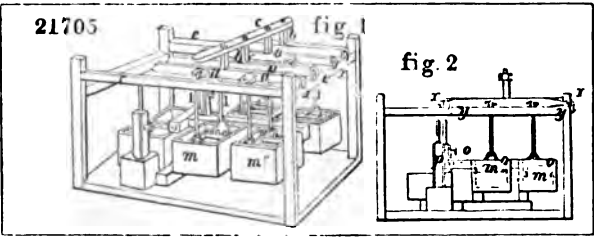
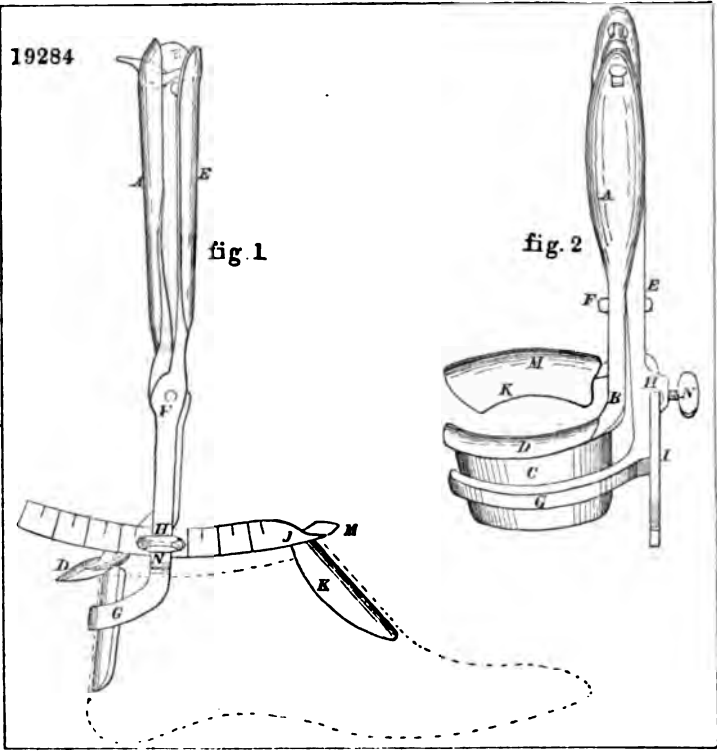


fig. 2





19211

fig. 1

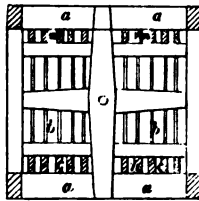
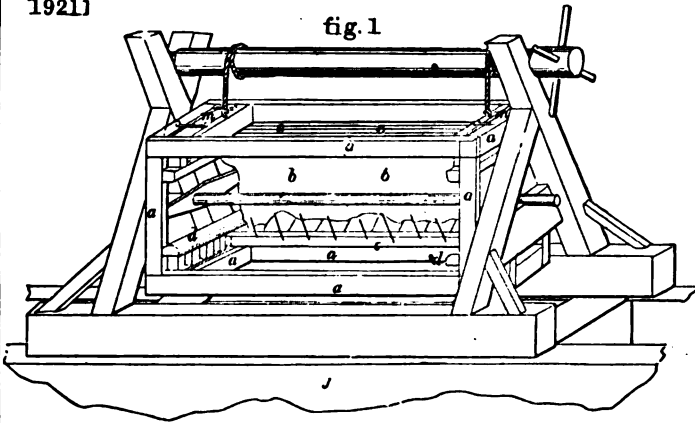
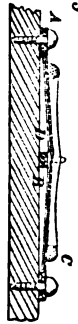
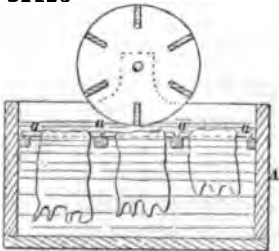


fig. 2

20250



21126



19934

fig. 1



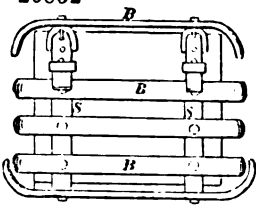
fig. 2



fig. 3



20832



22454

fig. 1

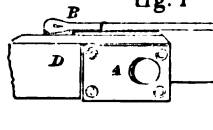


fig. 2



fig. 3

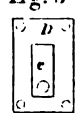


fig. 4



21394

fig. 1

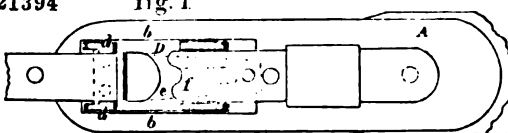
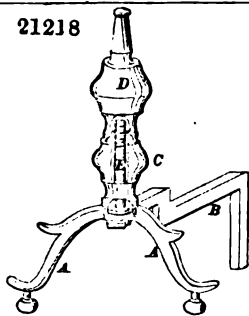


fig. 2

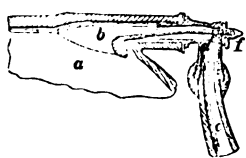




21218



20550



21695



20362

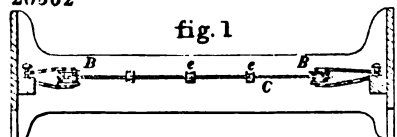


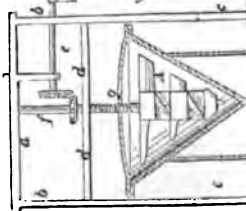
fig. 2

21042

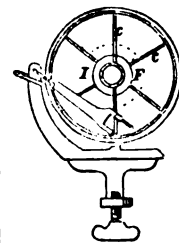
fig. 1



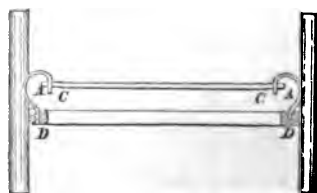
fig. 2



20814



20486



20295

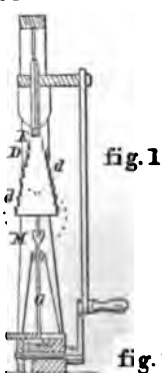


fig. 2



19402

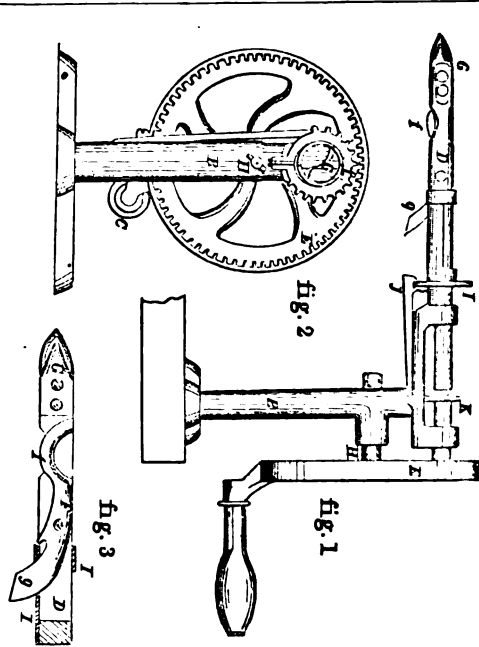
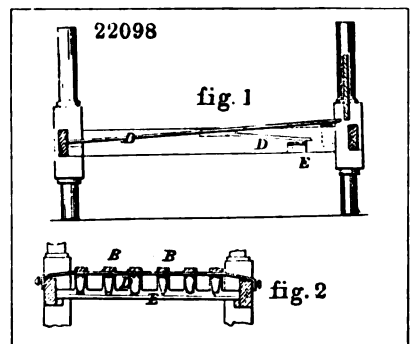
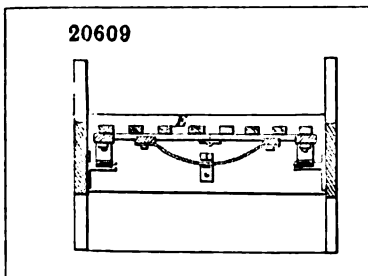
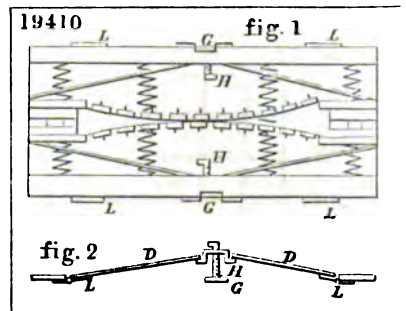
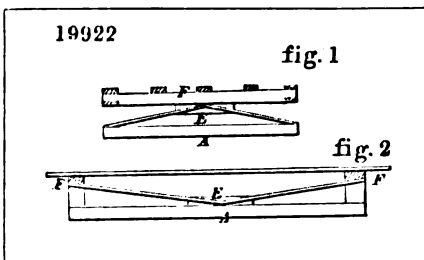
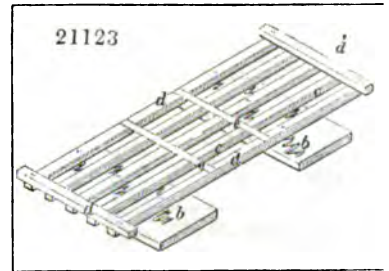
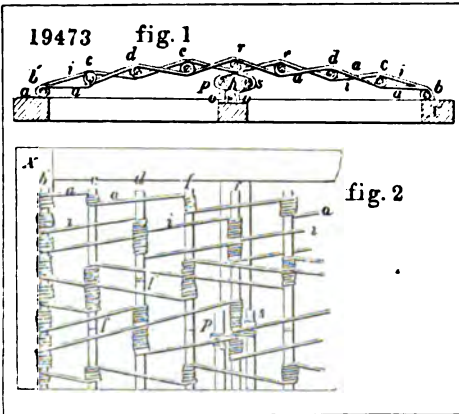
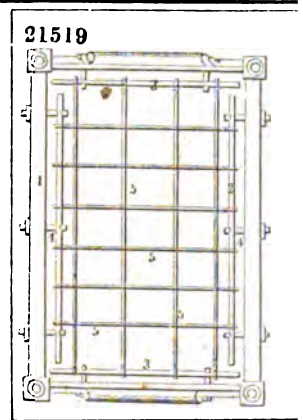
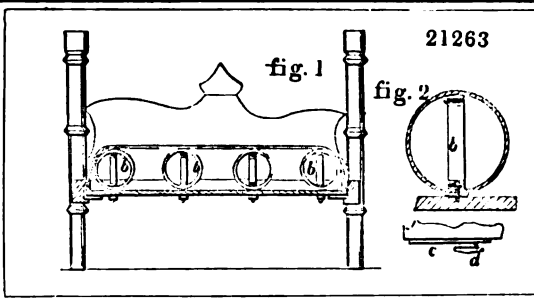


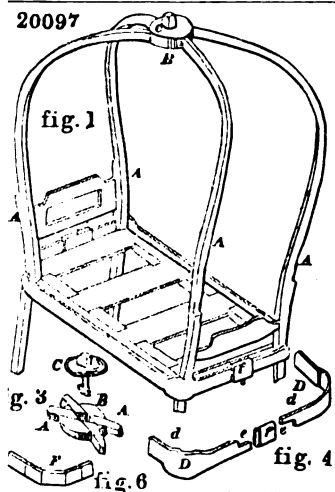
fig. 2

fig. 1

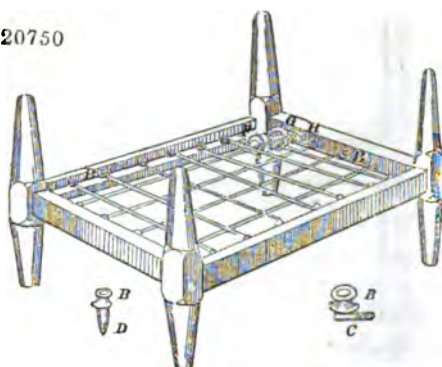
fig. 3



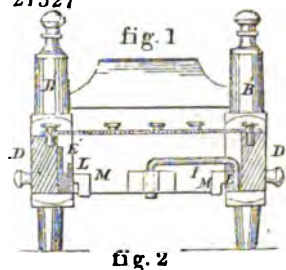
20097



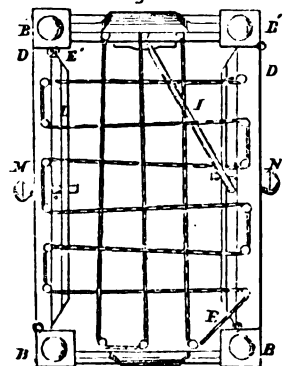
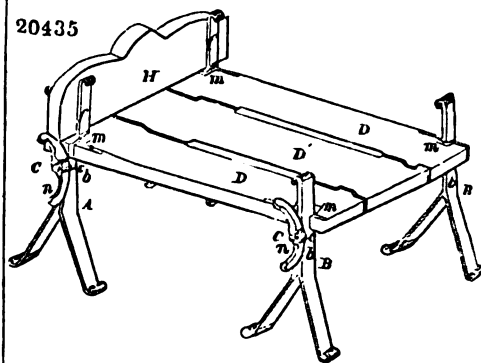
20750



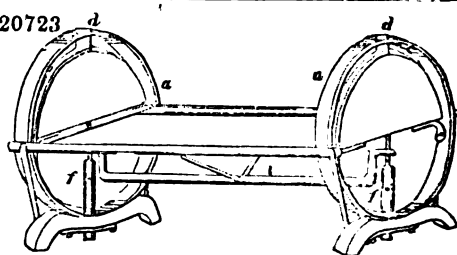
21527



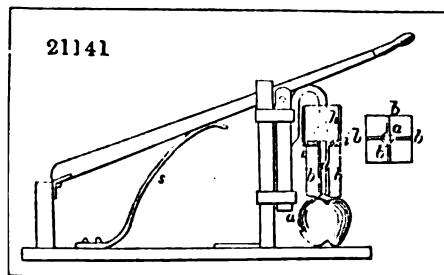
20435



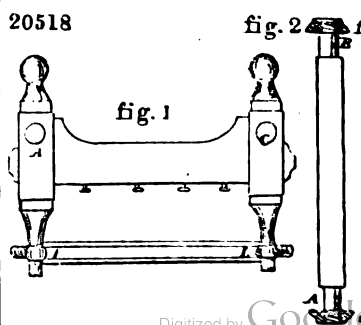
20723

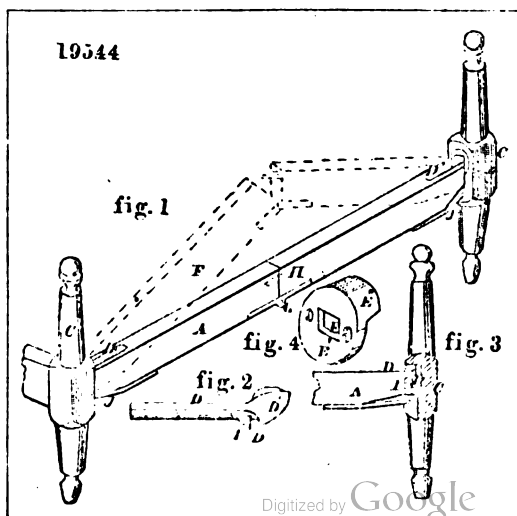
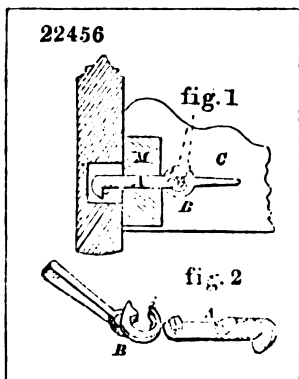
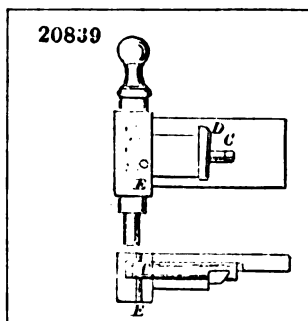
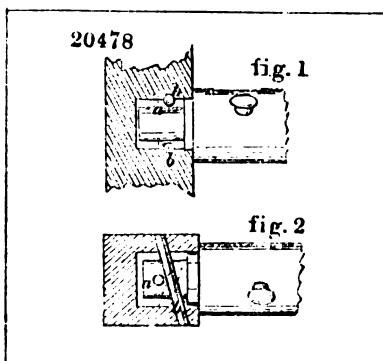
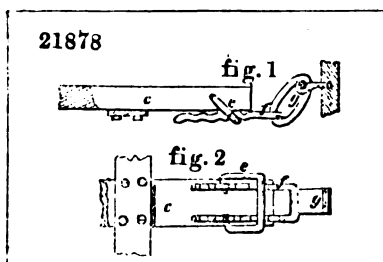
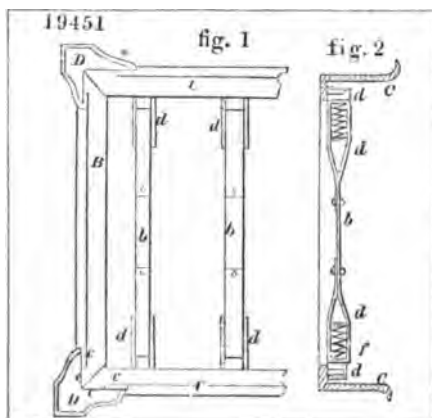
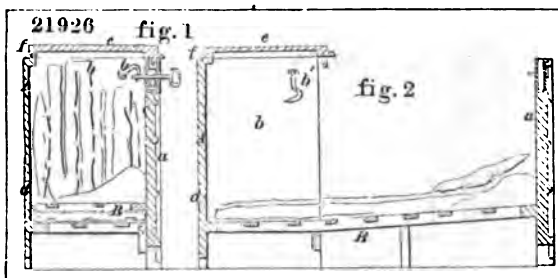
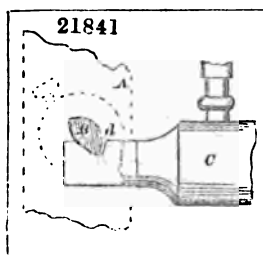


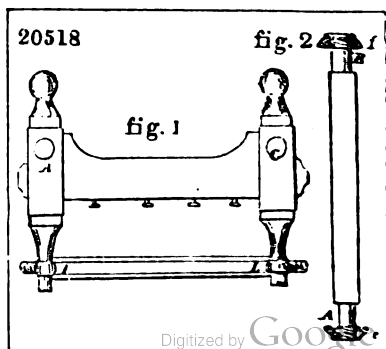
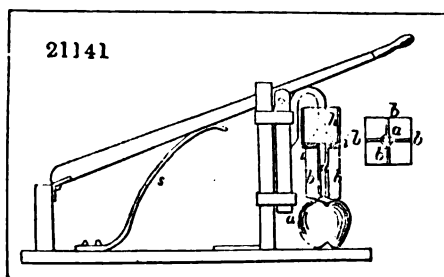
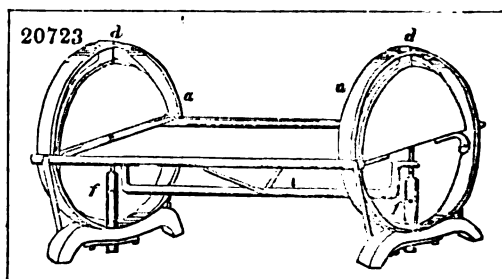
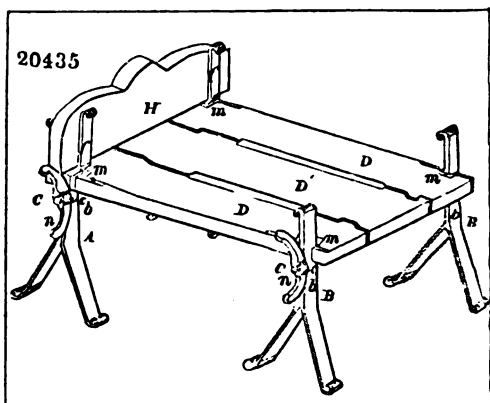
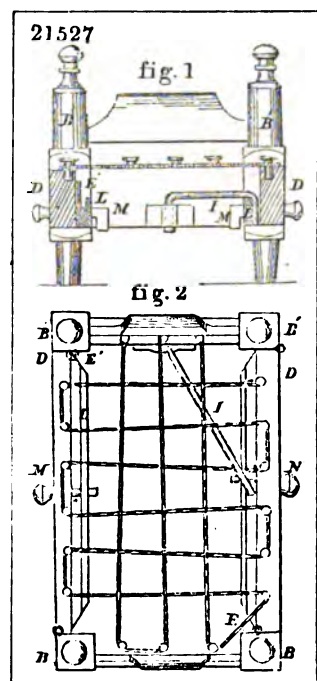
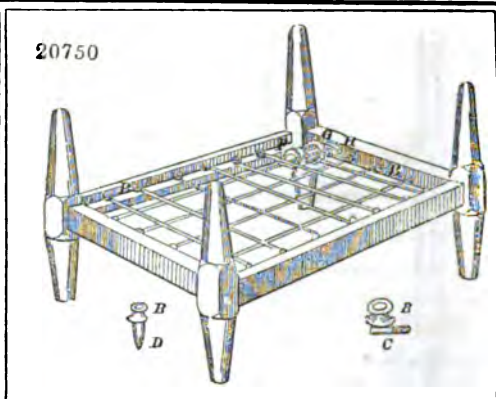
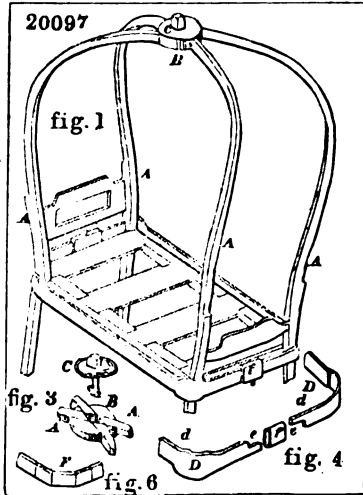
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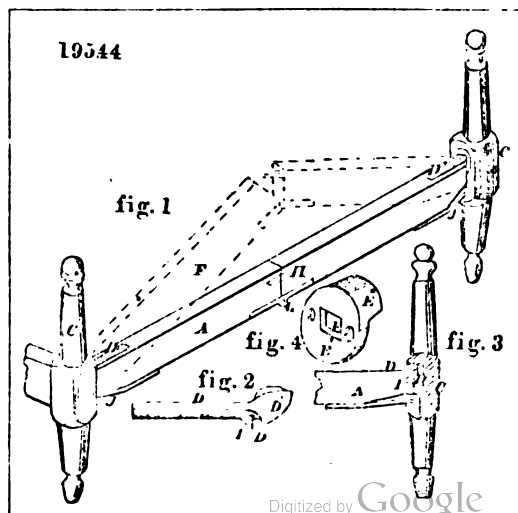
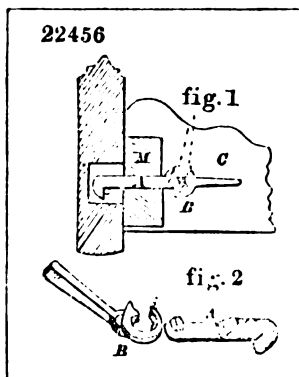
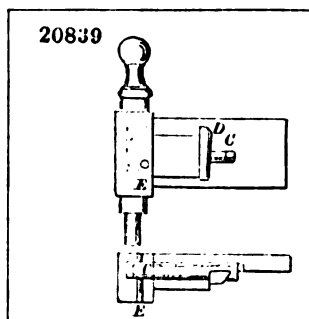
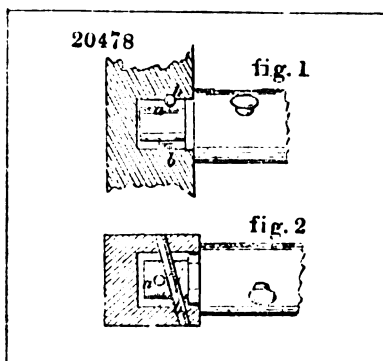
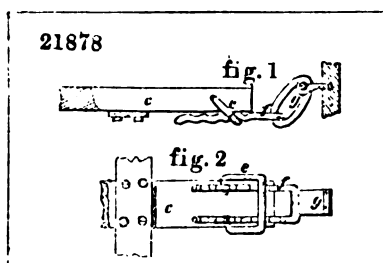
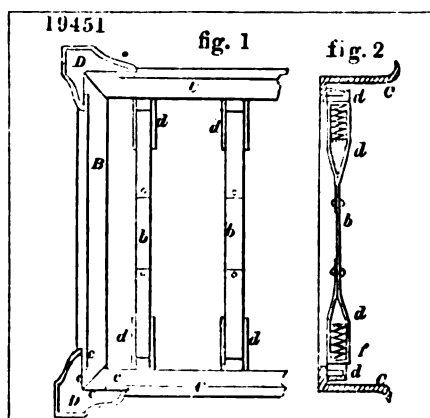
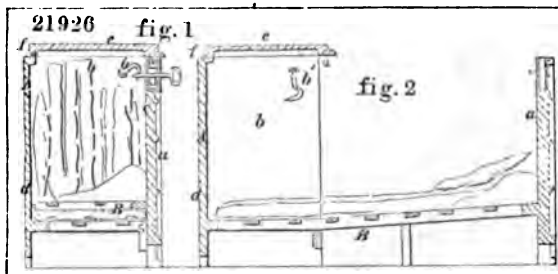
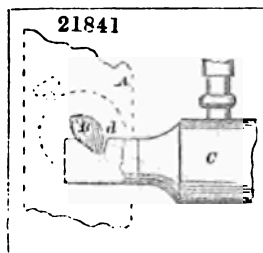


20518



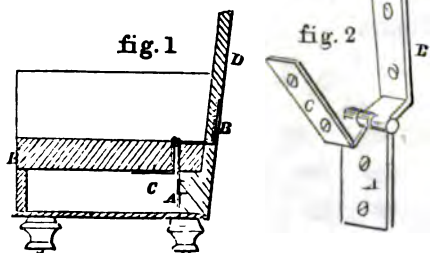




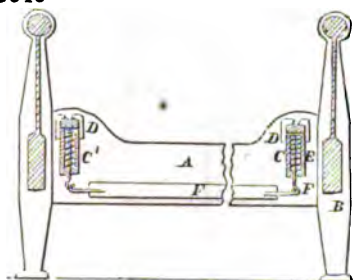




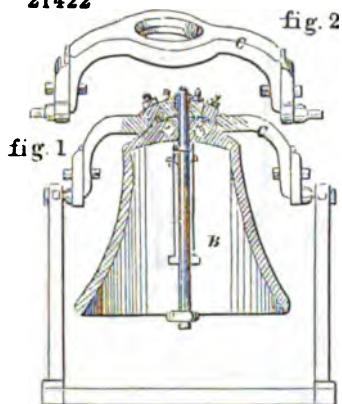
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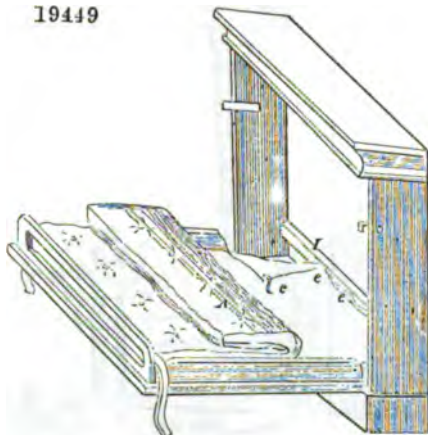
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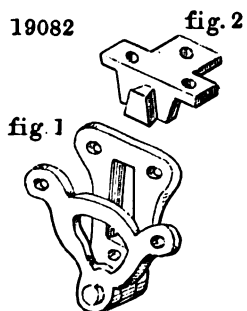
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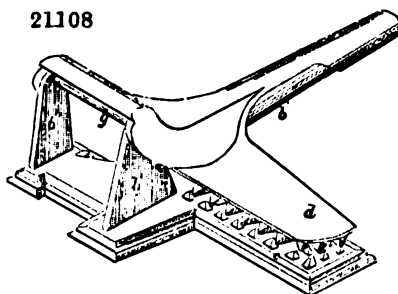
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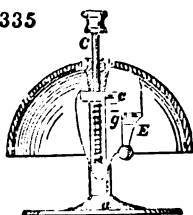
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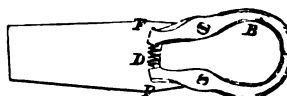
21108



21335

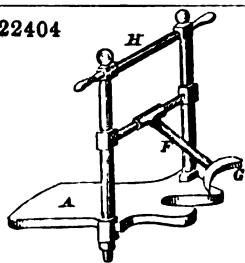


20307





22404



19075

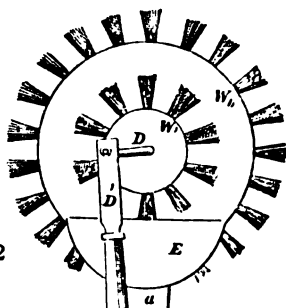


fig. 2

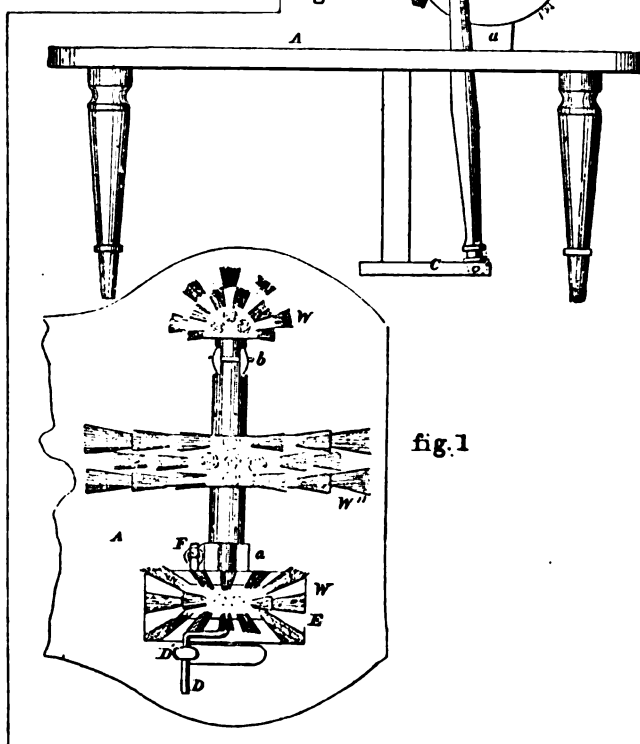
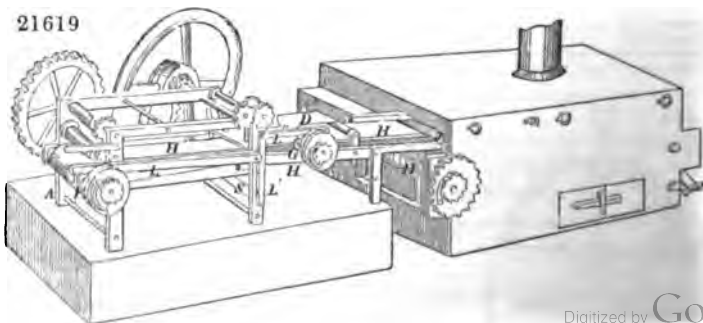
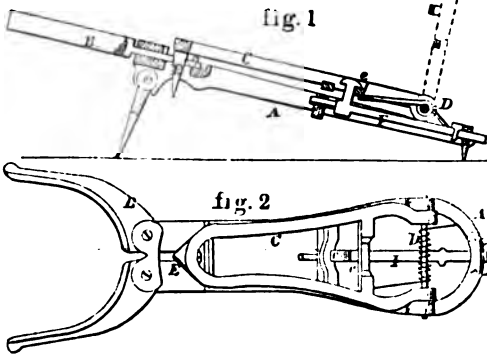


fig. 1

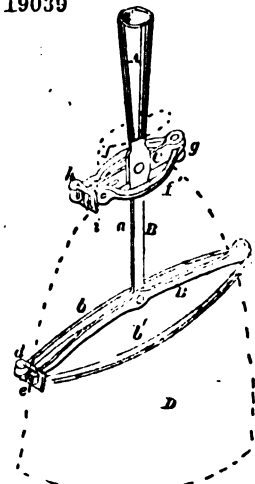
21619



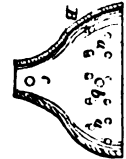
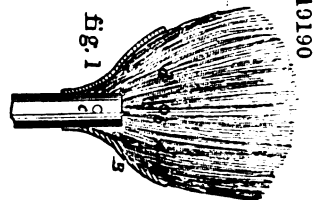
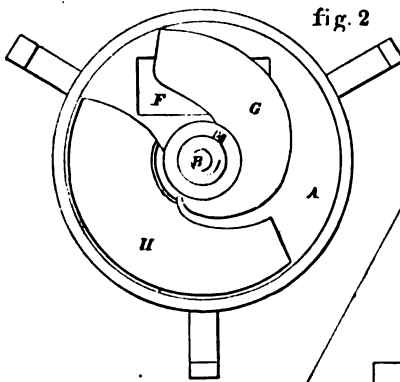
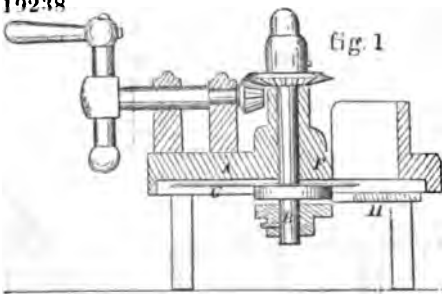
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19039



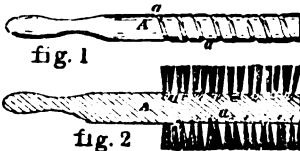
19238



20226



22381



19459

fig. 1

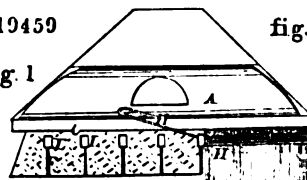
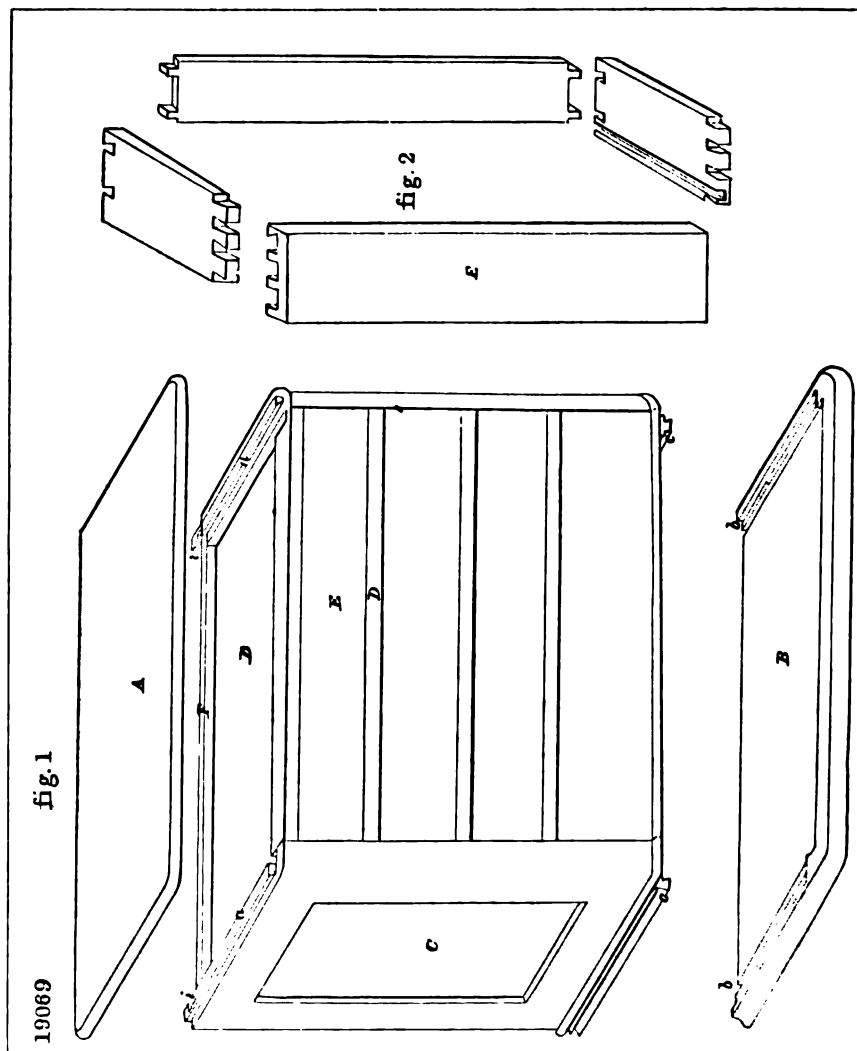
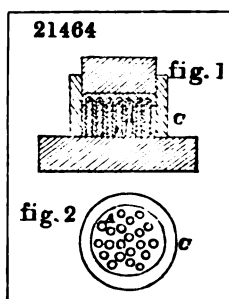
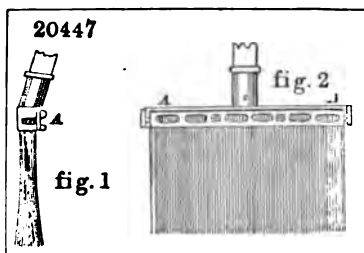
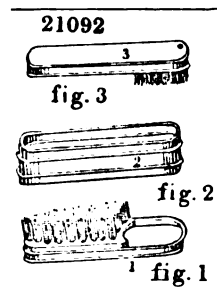
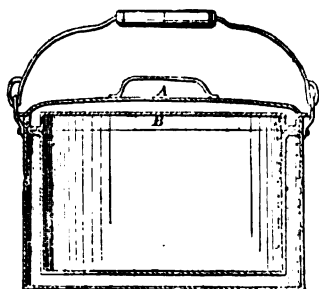


fig. 2

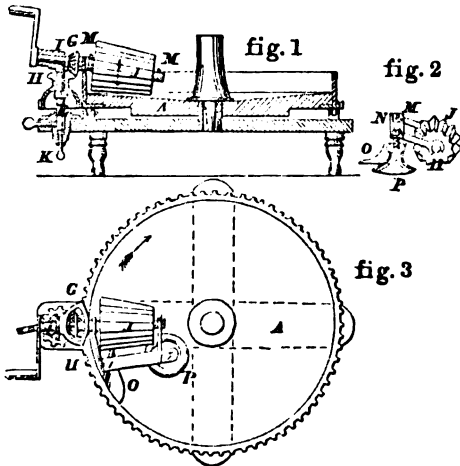




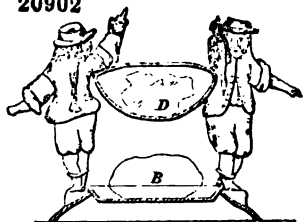
21220



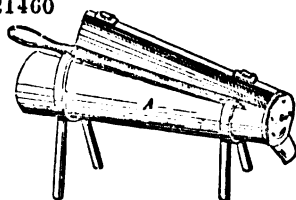
21106



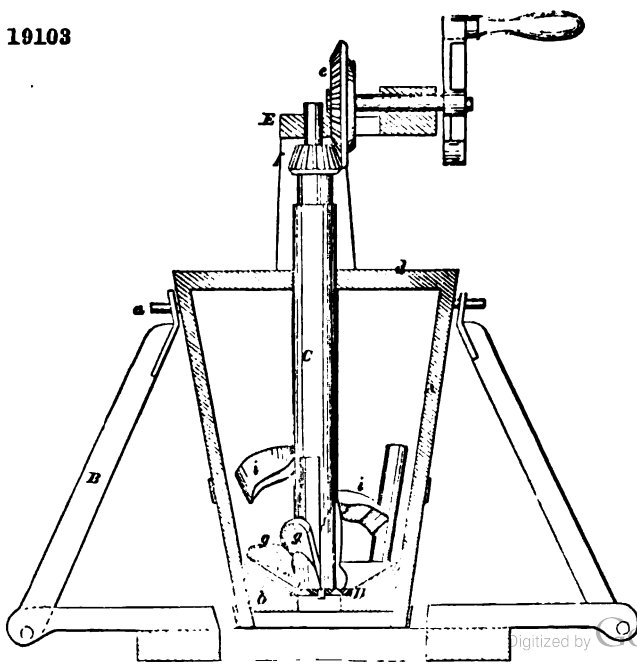
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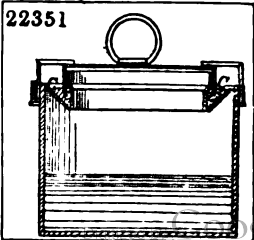
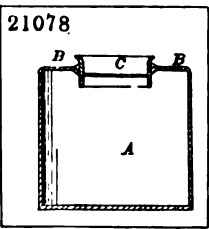
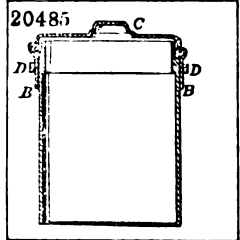
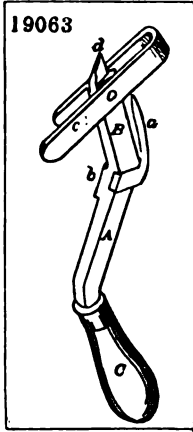
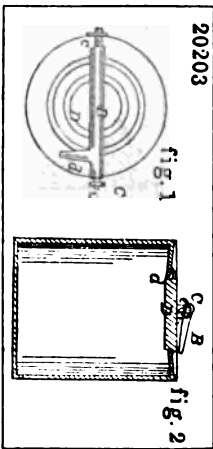
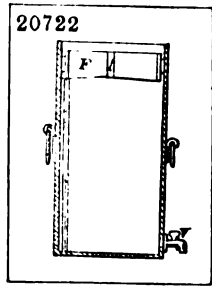
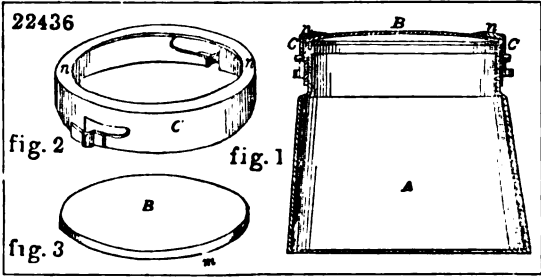
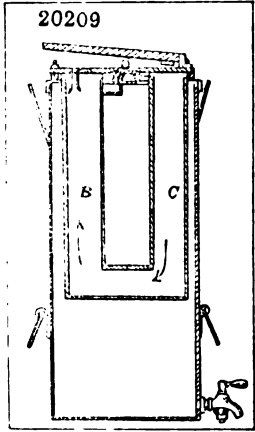
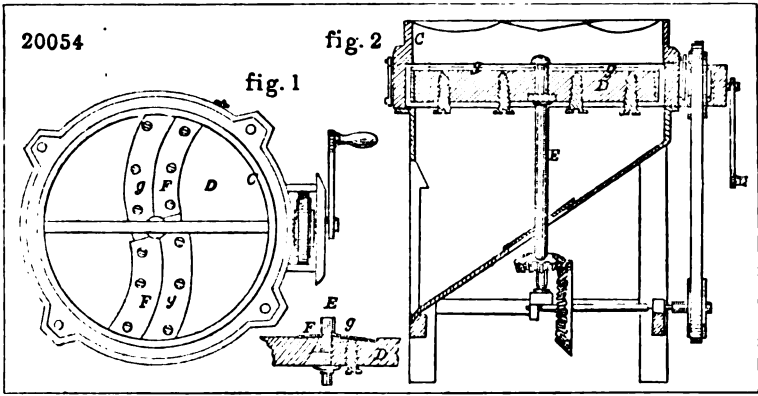


21460

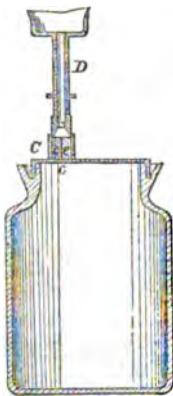


19103

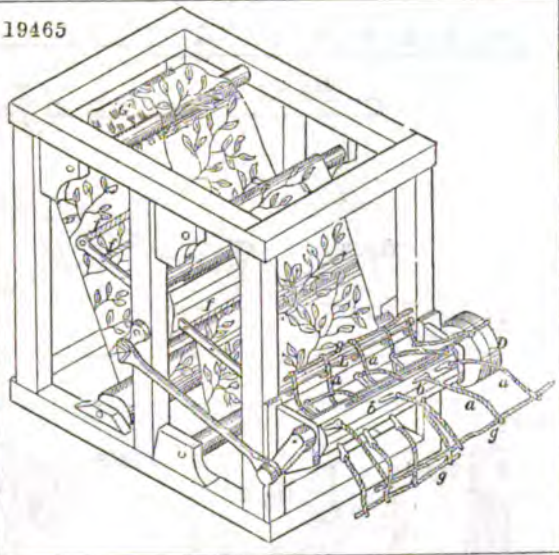




21348

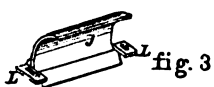
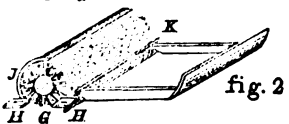
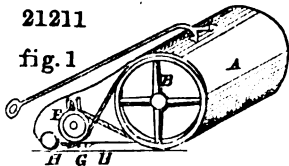


19465



21211

fig. 1



19164

fig. 1

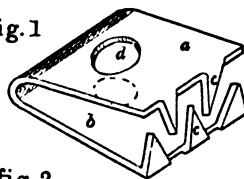
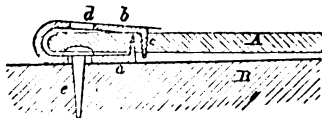
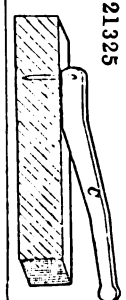


fig. 2



21325



22247

fig. 1

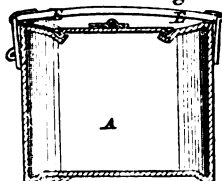
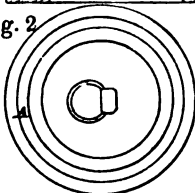
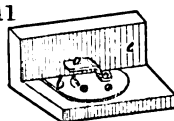


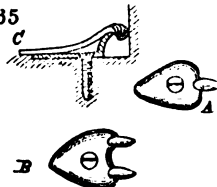
fig. 2



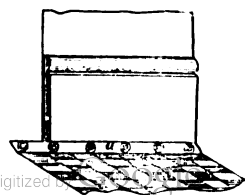
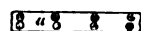
20341



21365



22354



Digitized

19230

fig. 1



fig. 2

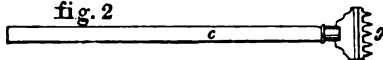
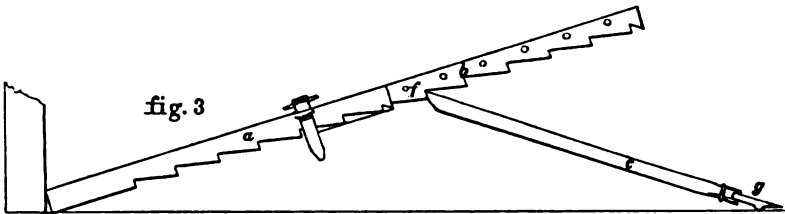


fig. 3

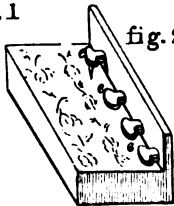


19882

fig. 1



fig. 2



19506

fig. 1

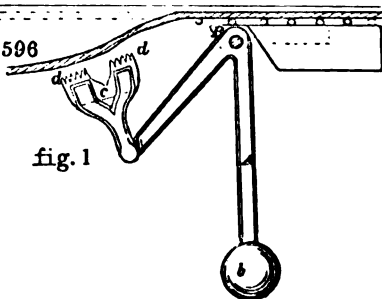
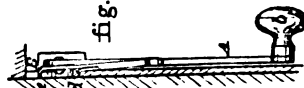
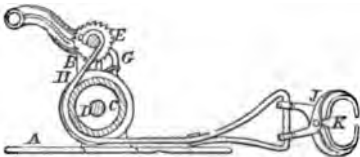


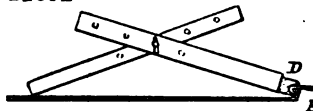
fig. 2



21303



21654



21600

fig. 1

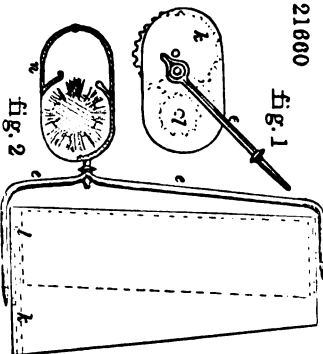


fig. 2



21233

fig. 1

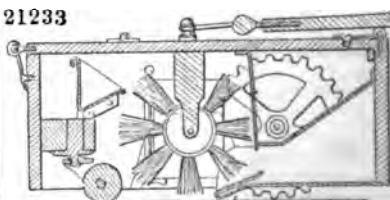
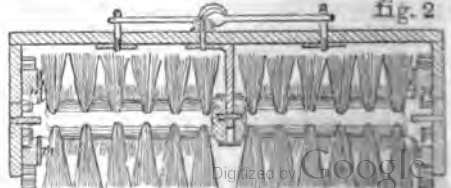
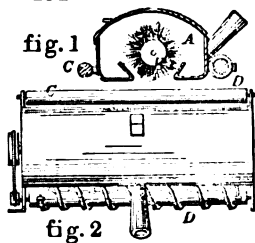


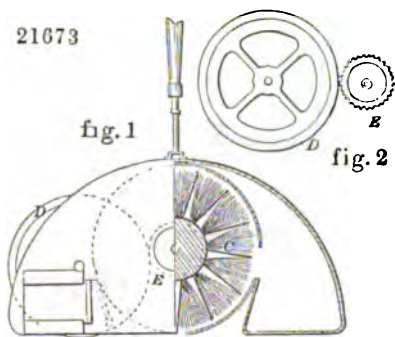
fig. 2



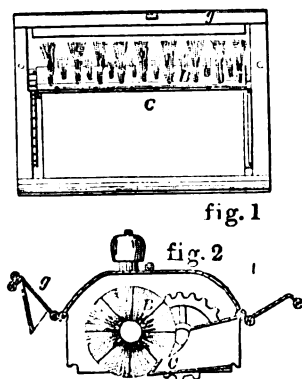
21451



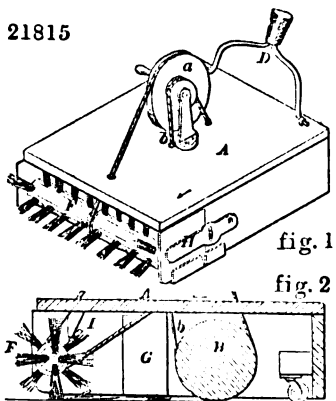
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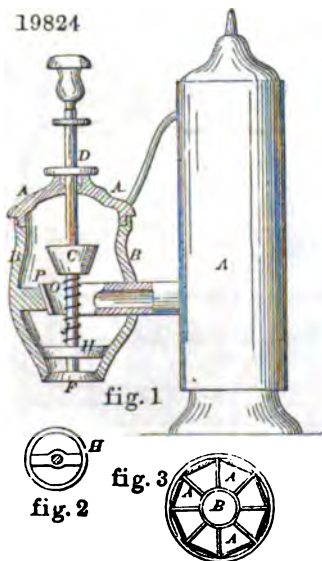
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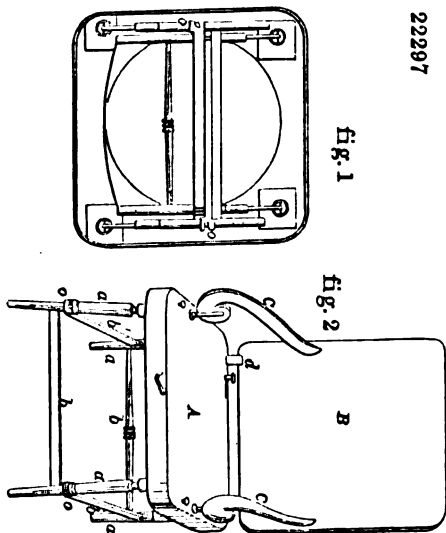
21815



19824

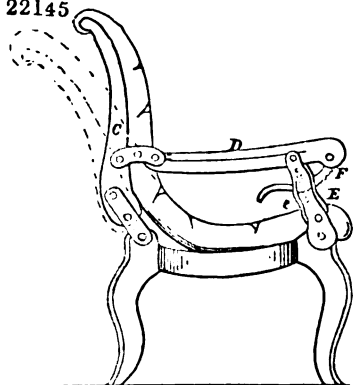


22297

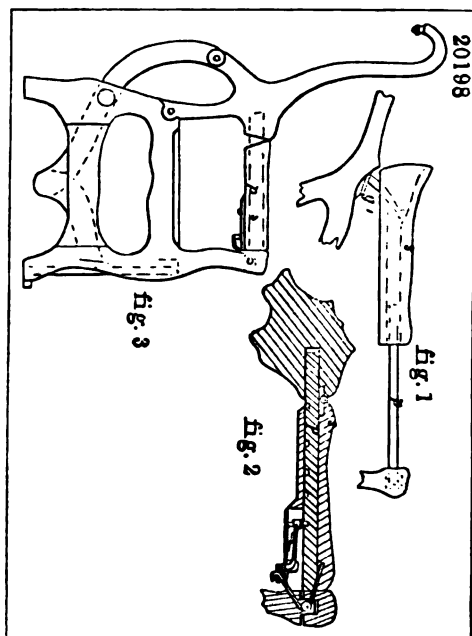
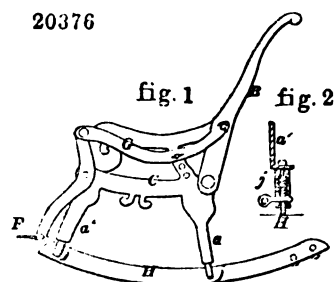




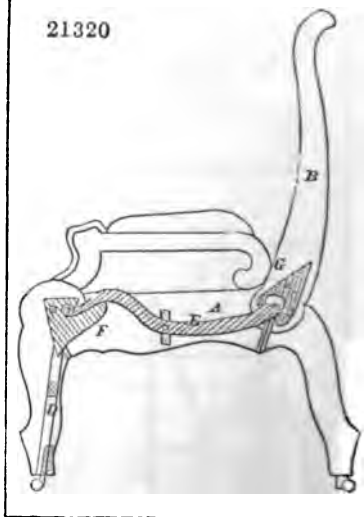
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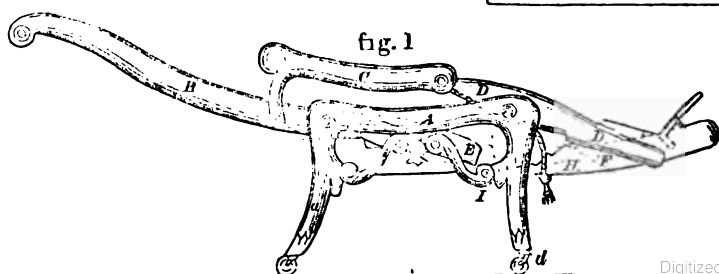
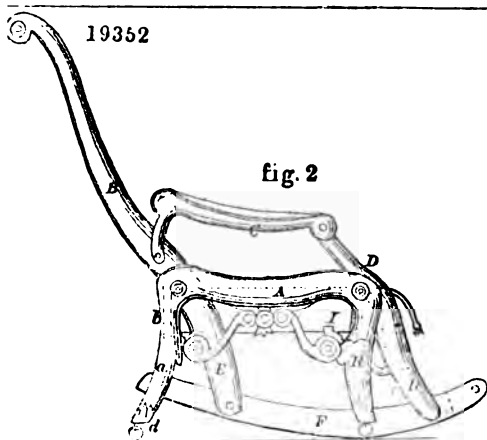
20376



21320



19352



19343

fig. 1

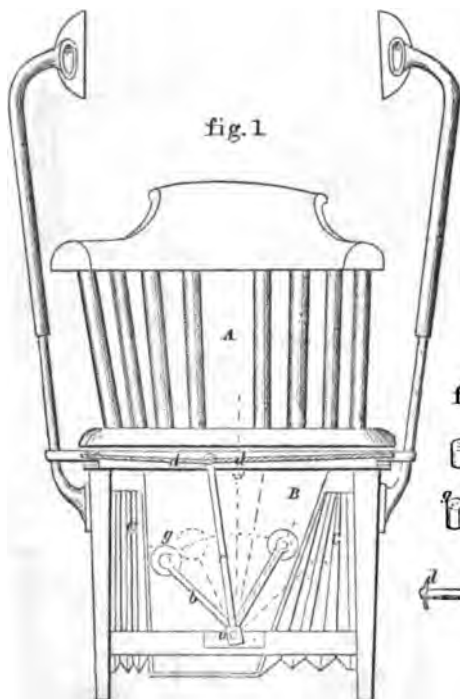
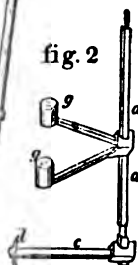
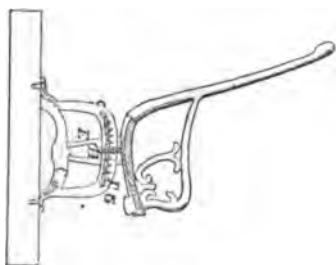


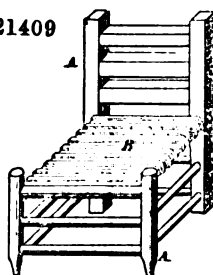
fig. 2



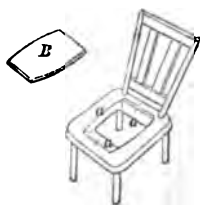
20863



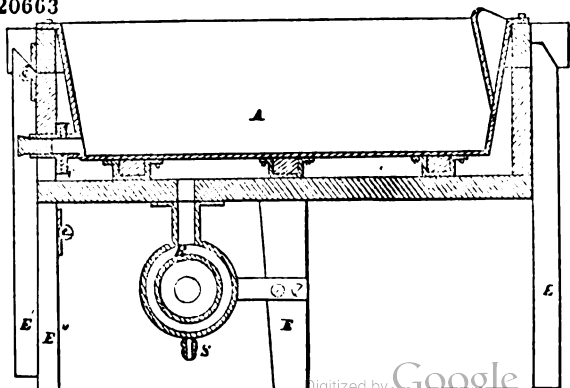
21409



22419



20663



19476

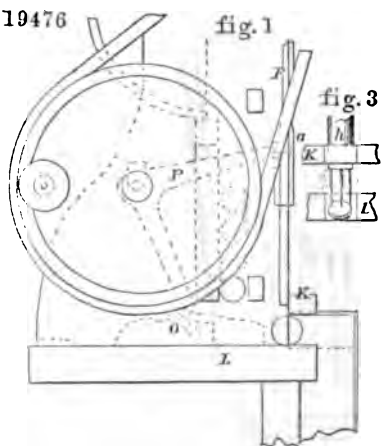
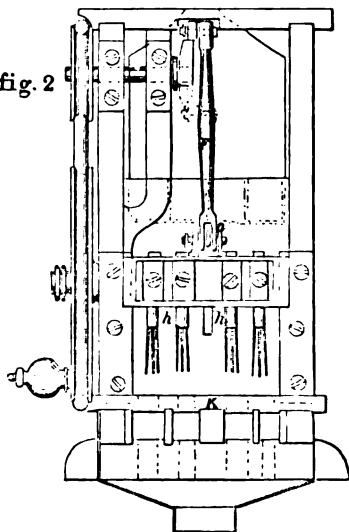


fig. 1



fig. 3

fig. 2



22464

fig. 1

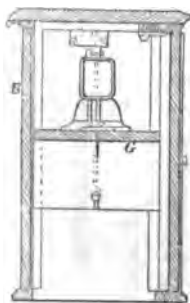
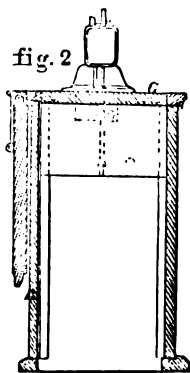


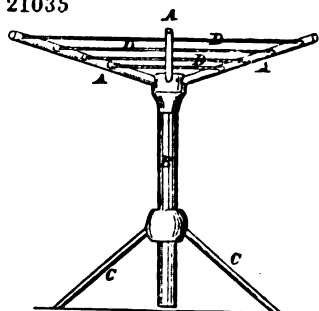
fig. 2



19772



21035



20964

fig. 1

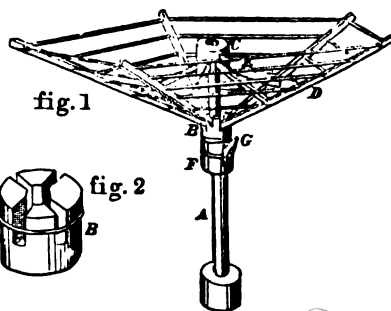
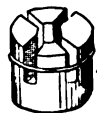
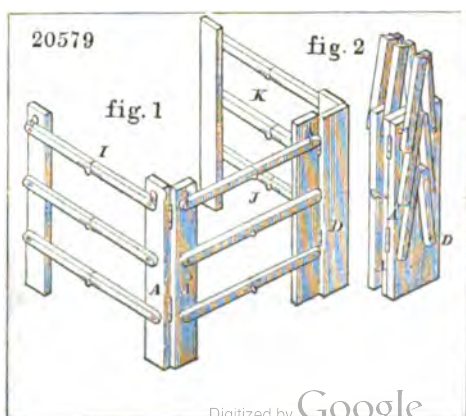
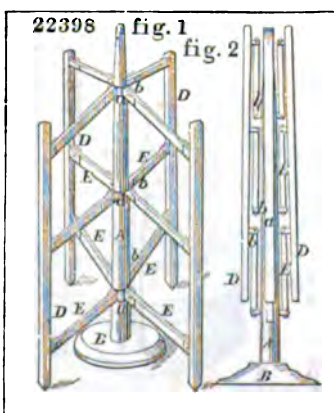
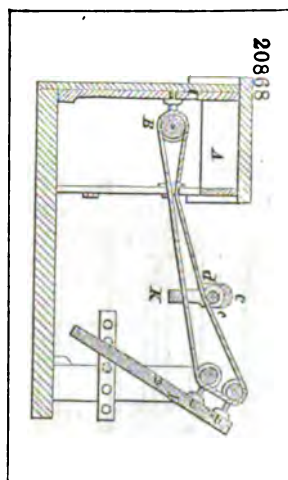
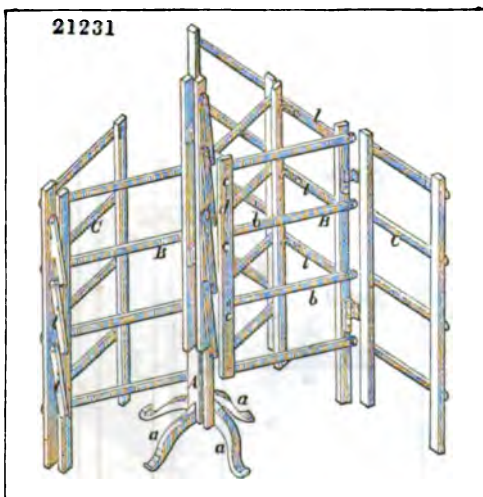
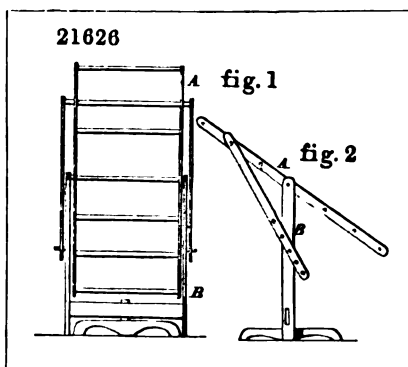
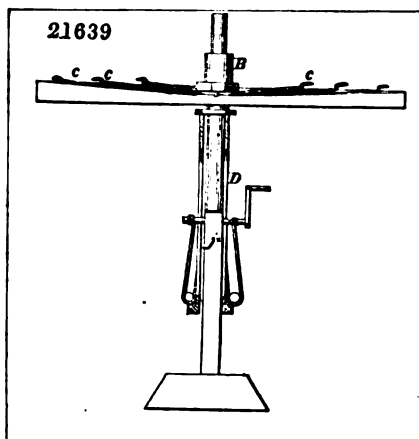
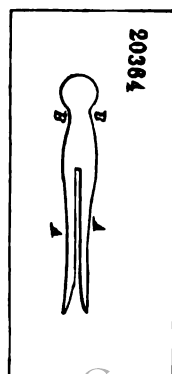
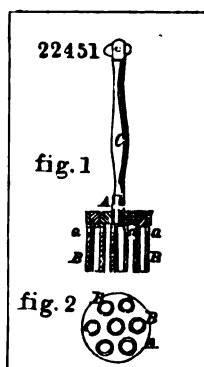
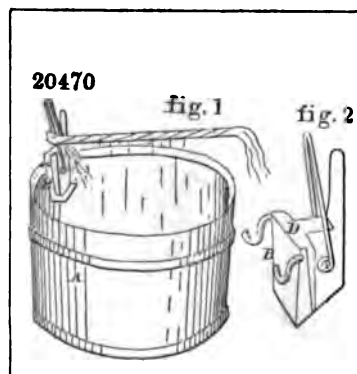
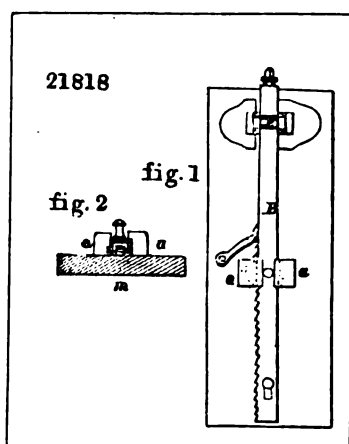
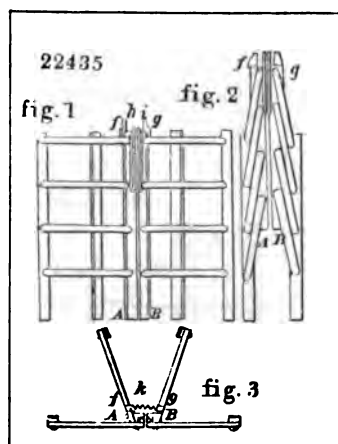
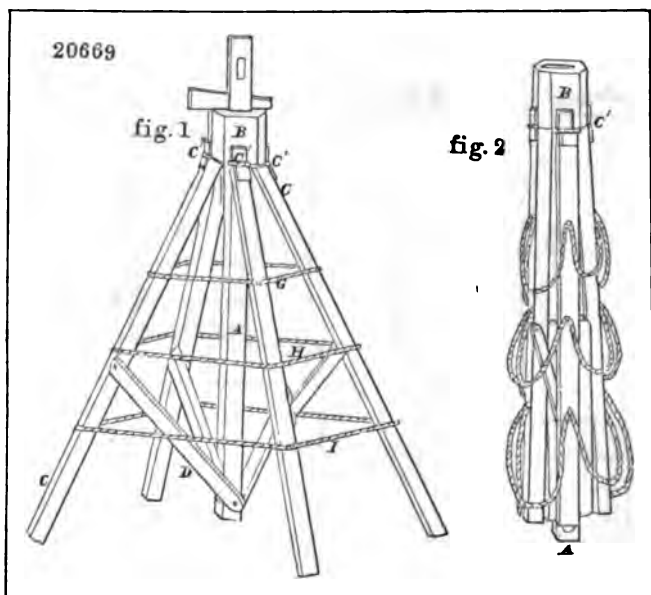
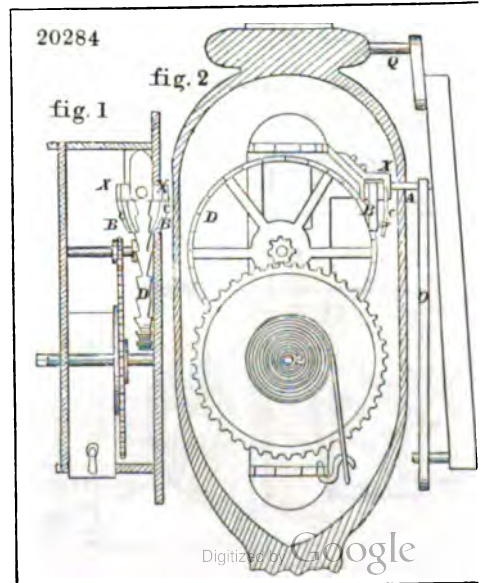
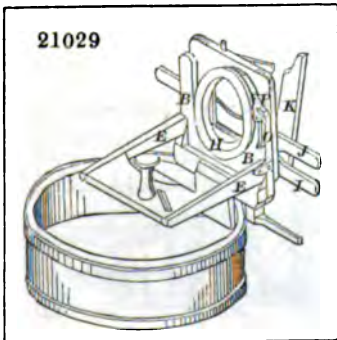
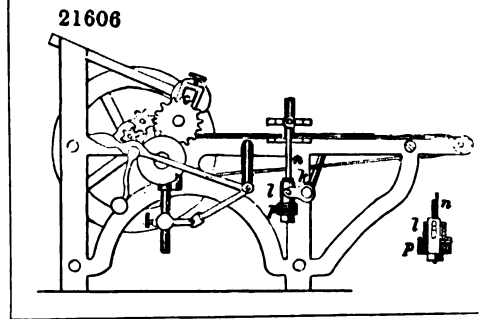
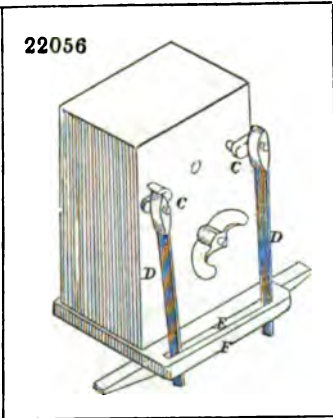
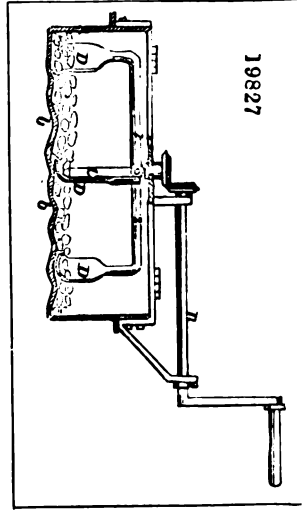
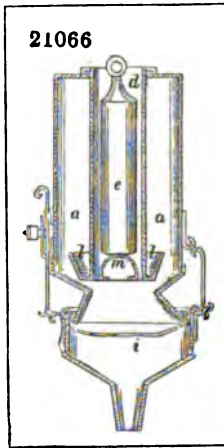
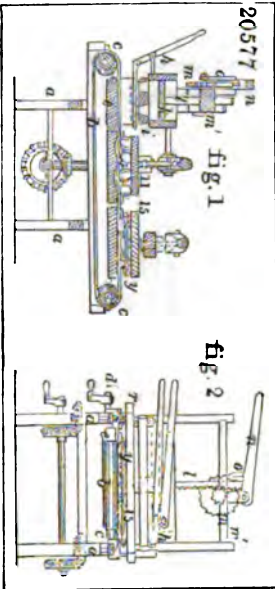


fig. 2









22349

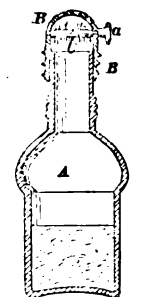
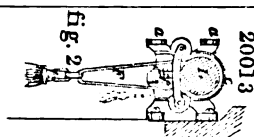


fig. 2



20013

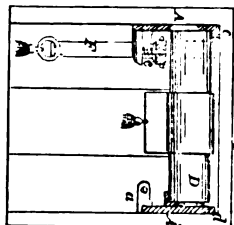


fig. 1

19560

fig. 1

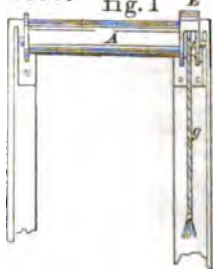


fig. 2



22153

fig. 1

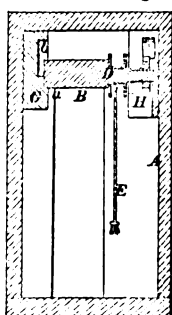
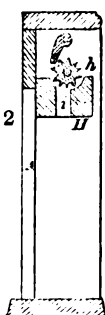


fig. 2



19610

fig. 1

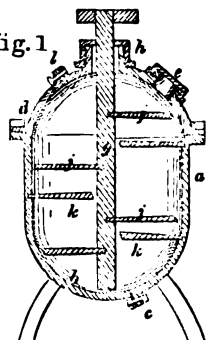
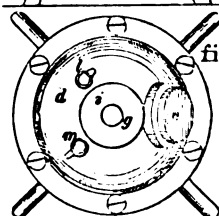
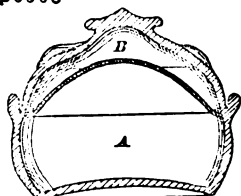


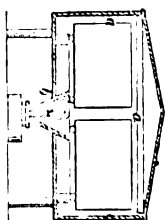
fig. 2



20906



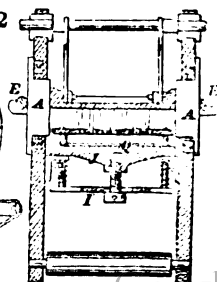
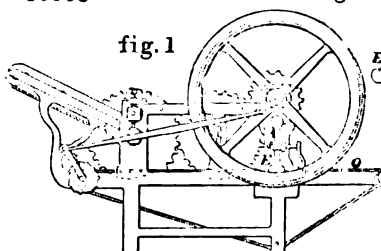
21683



19968

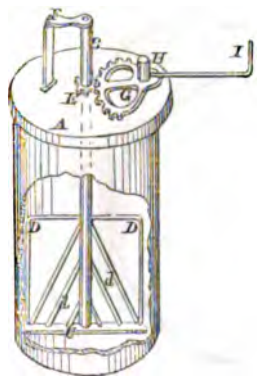
fig. 2

fig. 1

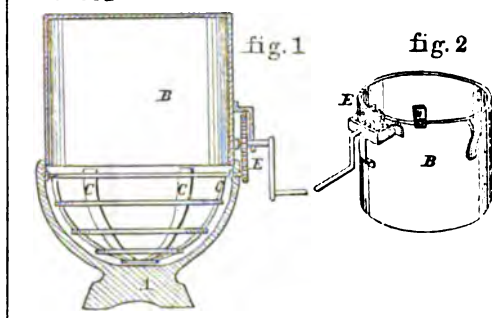




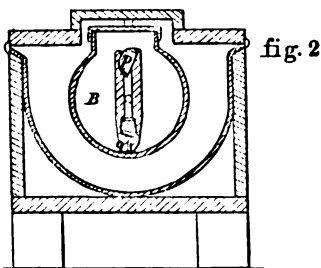
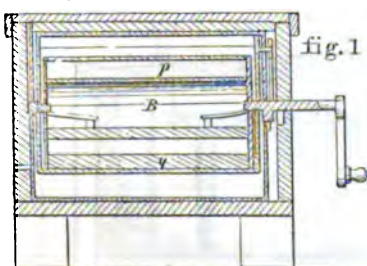
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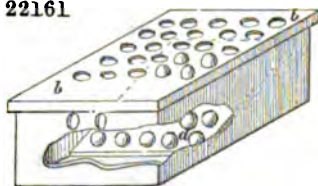
20032



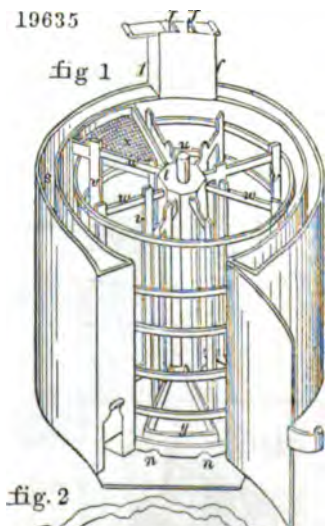
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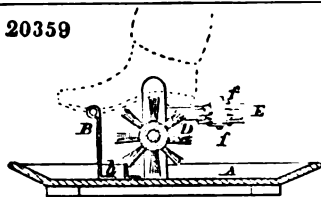
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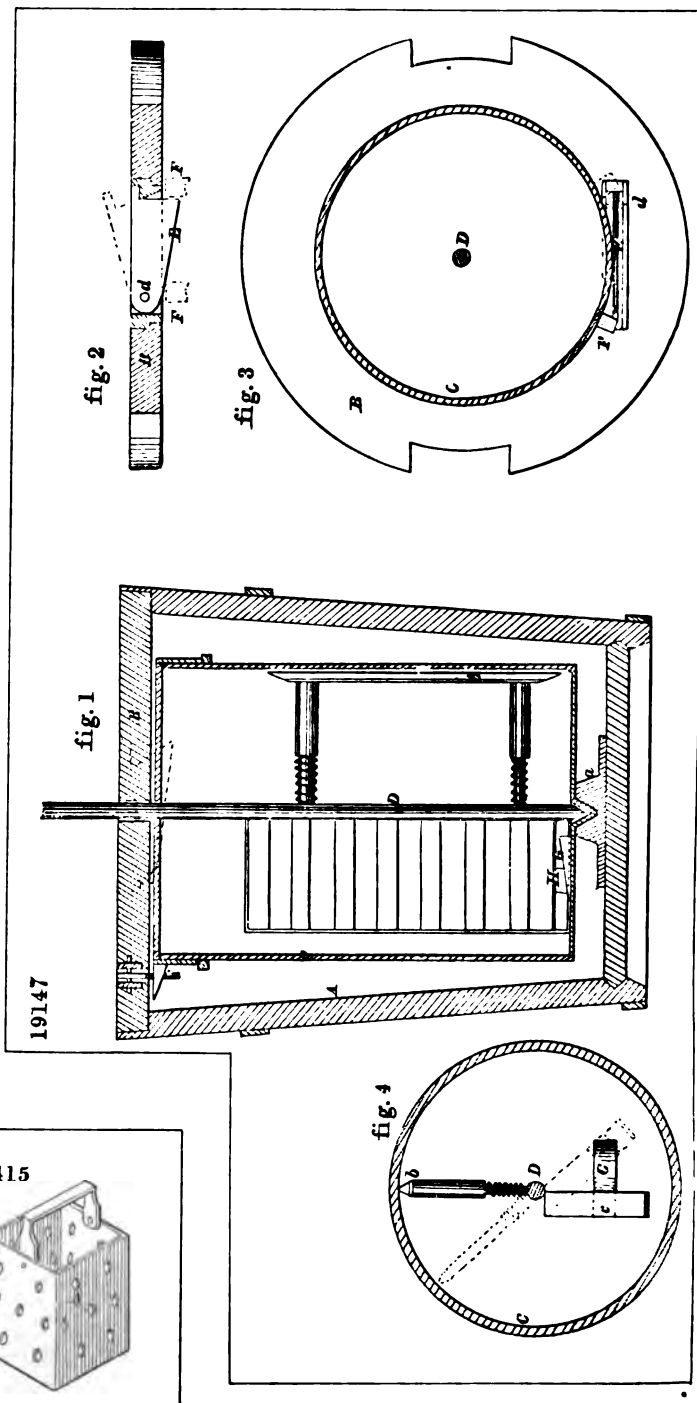
19635



20359



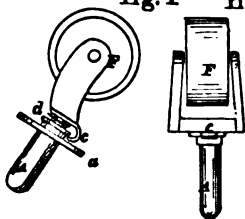




20031

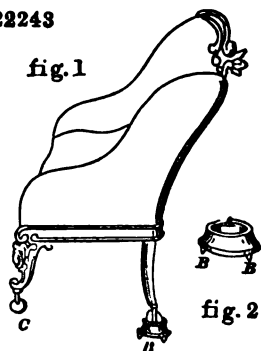
fig. 1

fig. 2



22243

fig. 1



19127

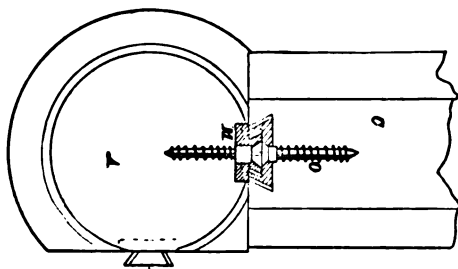


fig. 2

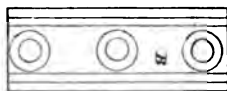


fig. 4



fig. 1

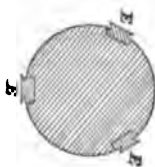
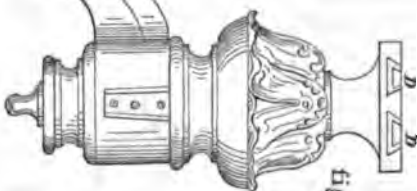
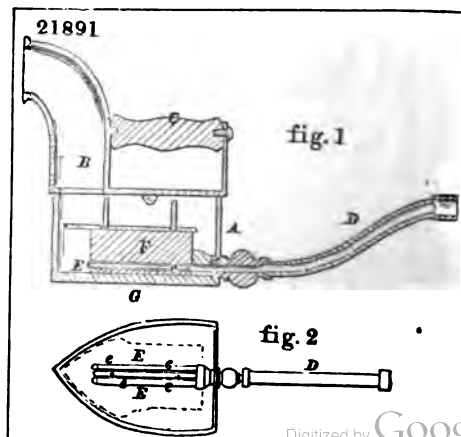
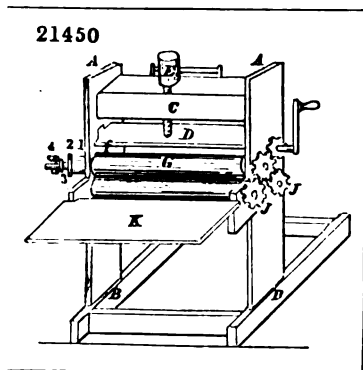
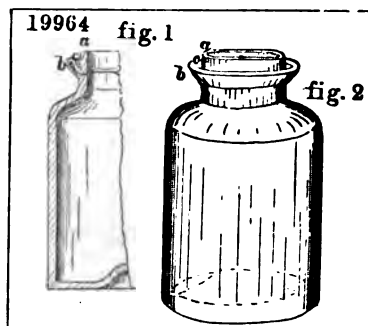
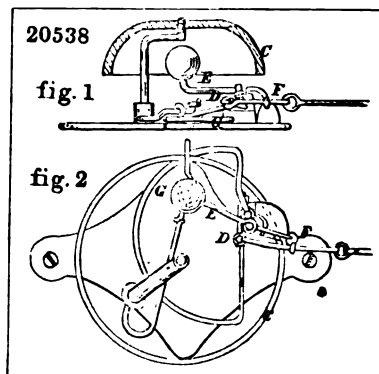
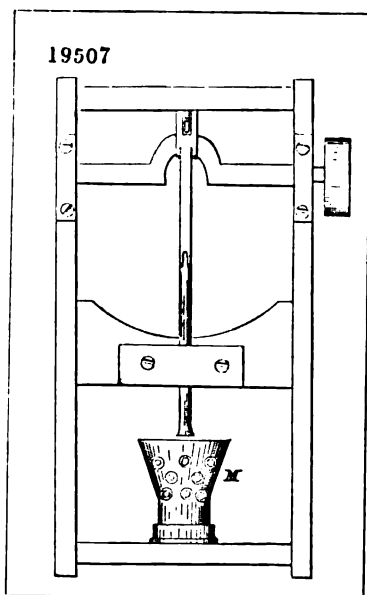
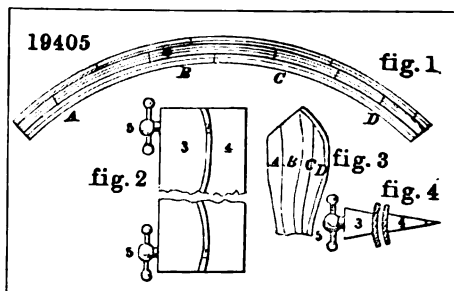
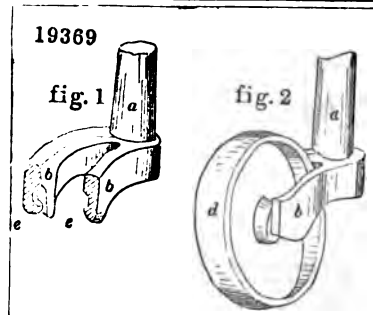
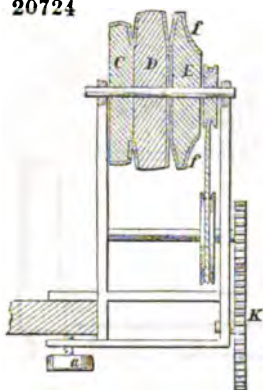


fig. 3





20724



22055

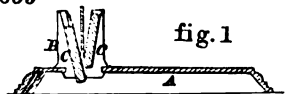


fig. 1

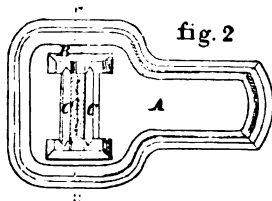
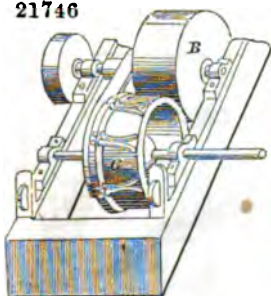
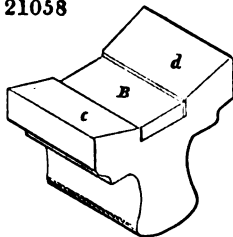


fig. 2

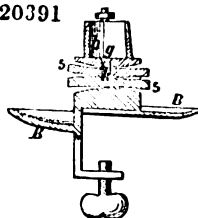
21746



21058



20391



22066

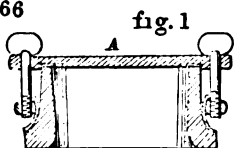


fig. 1

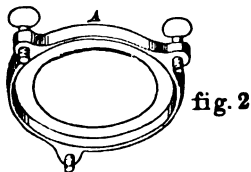
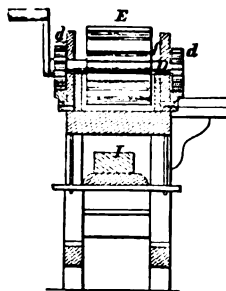


fig. 2

21442



20340

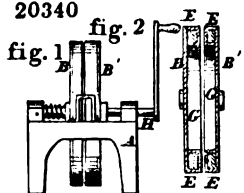


fig. 1

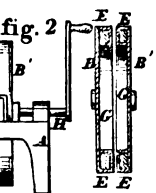


fig. 2

20929

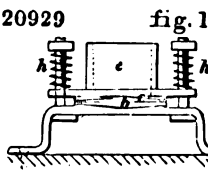


fig. 1

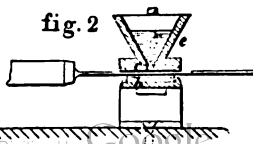
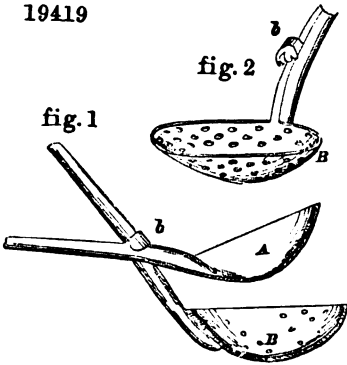


fig. 2

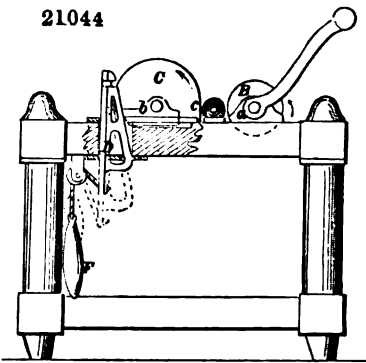
19419

fig. 1

fig. 2



21044



20112

fig. 1

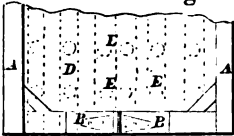
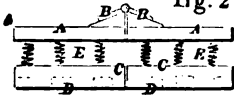


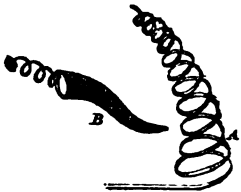
fig. 2



19347



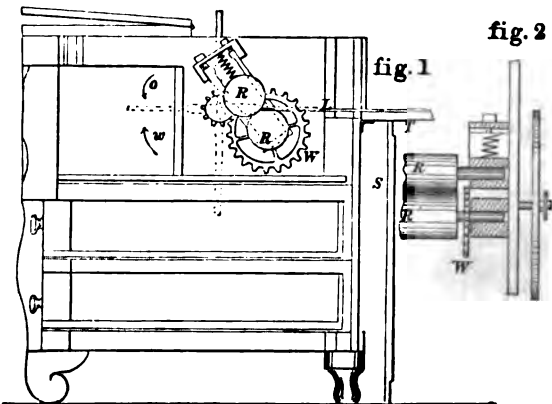
22037



20002

fig. 2

fig. 1



19681

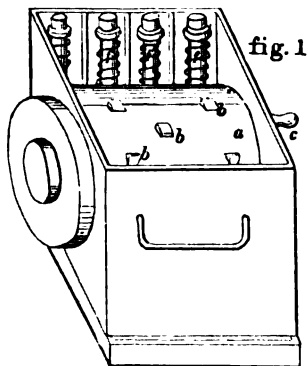


fig. 1

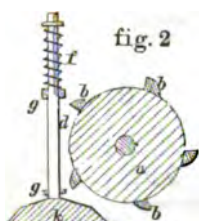
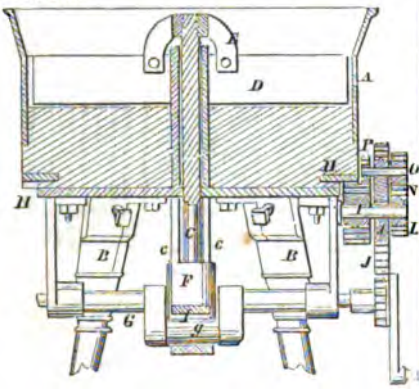


fig. 2

21514



20258



19547

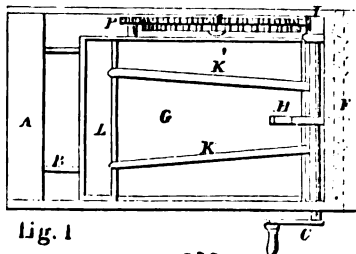
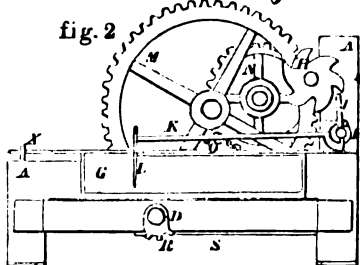


fig. 1

fig. 2



20019

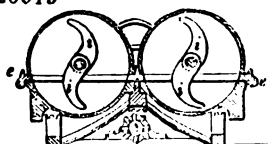
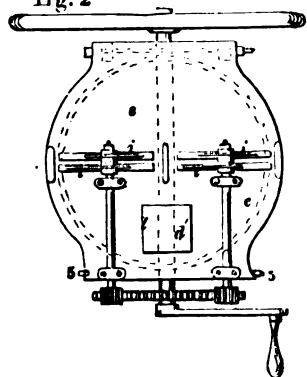
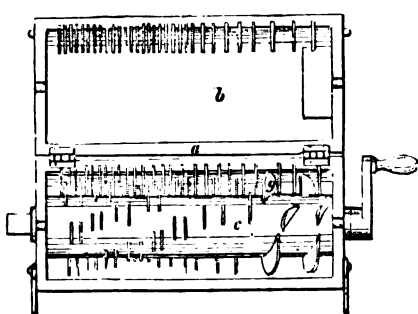


fig. 1

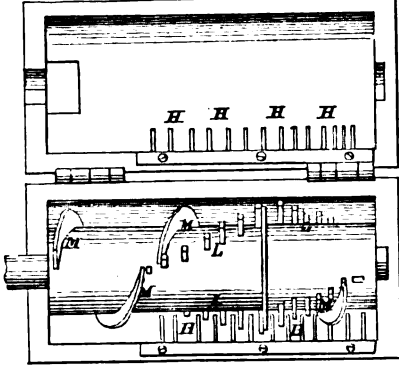
fig. 2



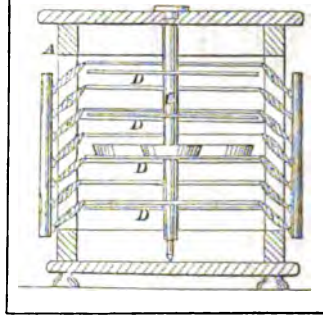
21421



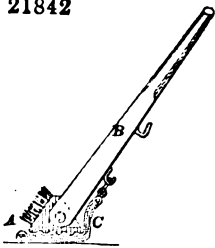
19728



21016



21842



19965

fig. 1

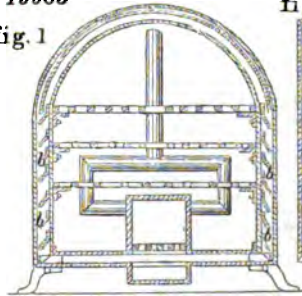
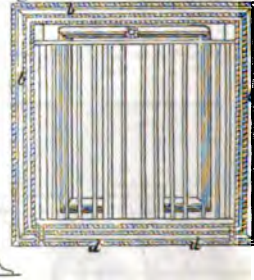


fig. 2



21019

fig. 1

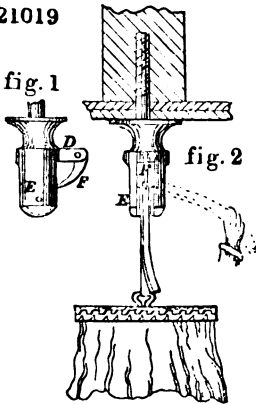


fig. 2

19050

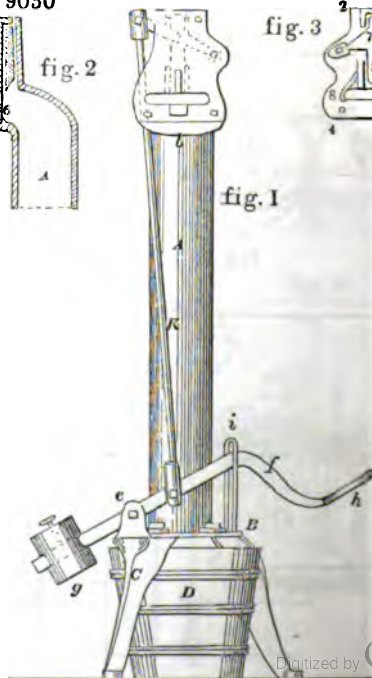
fig. 2



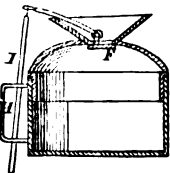
fig. 3



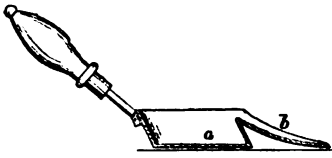
fig. 1



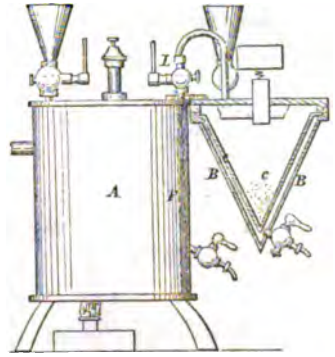
19648



20811.



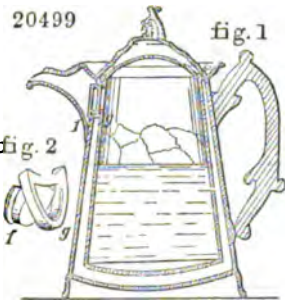
19780



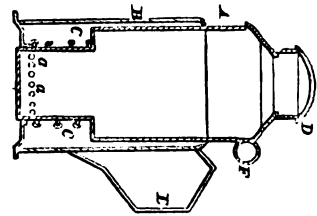
20499

fig. 1

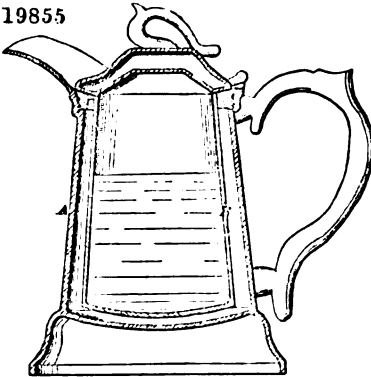
fig. 2



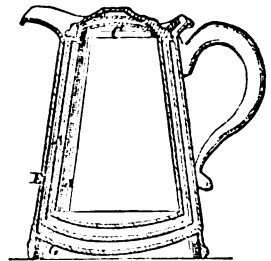
19182



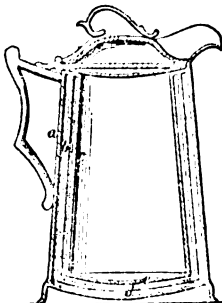
19855



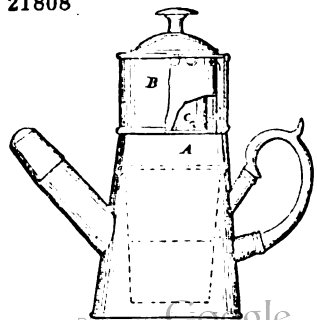
20592



21717



21808





20517

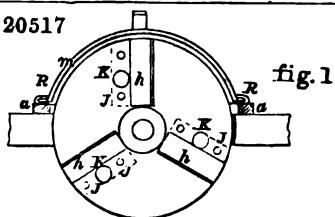


fig. 1

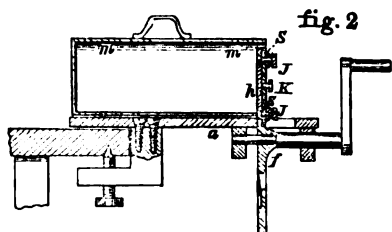


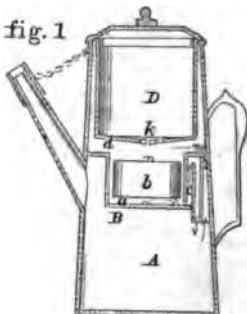
fig. 2

22278

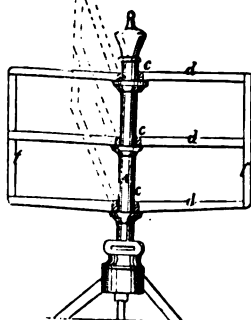
fig. 2



fig. 1



21131



20764

fig. 1

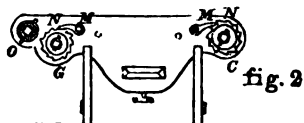
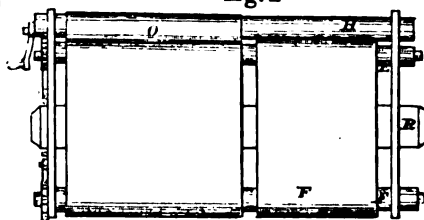
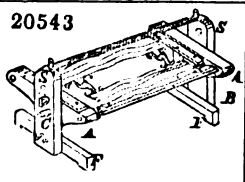


fig. 2

20543



20974

fig. 1

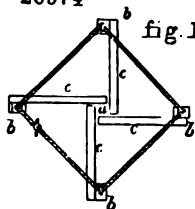
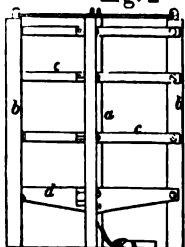
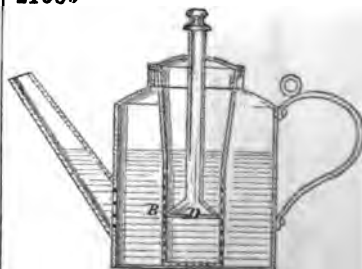


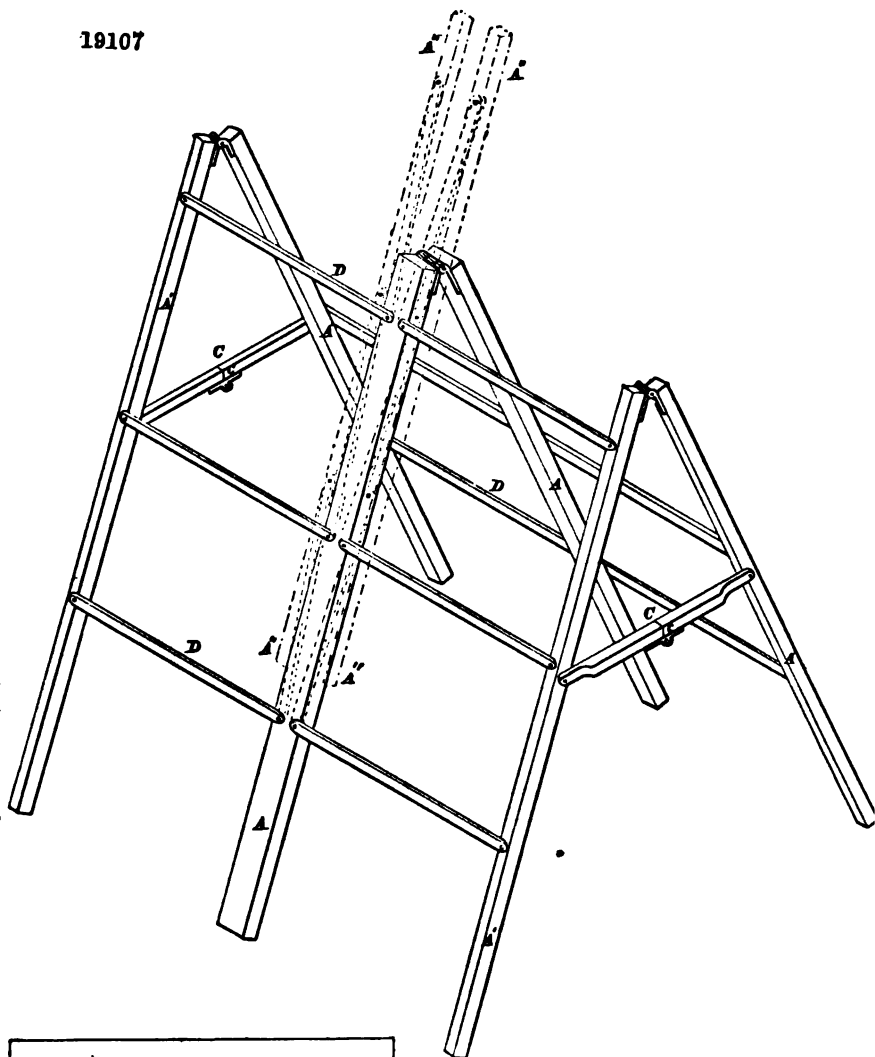
fig. 2



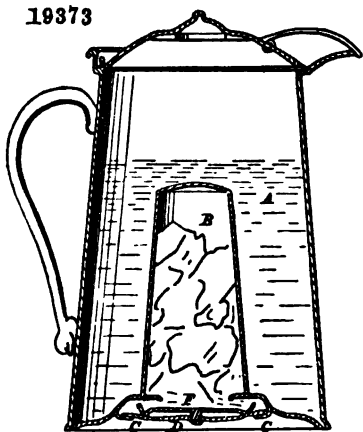
21589



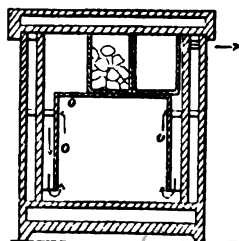
19107



19373



19837



20621

fig. 2

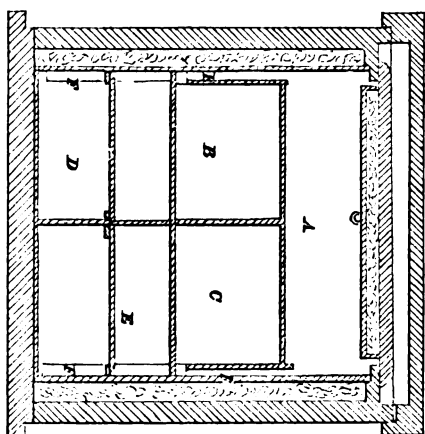


fig. 1

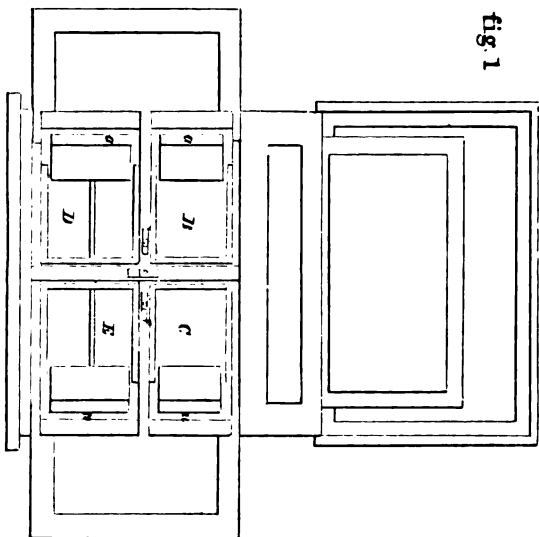
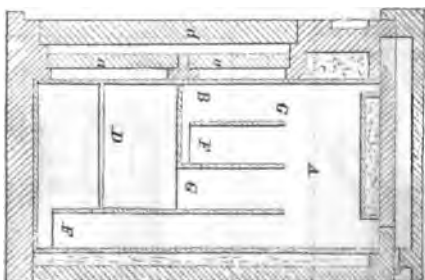
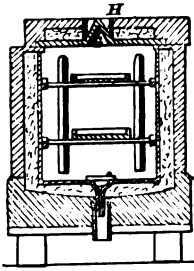


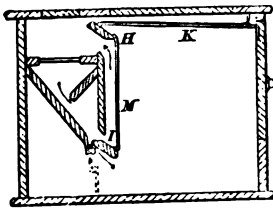
fig. 3



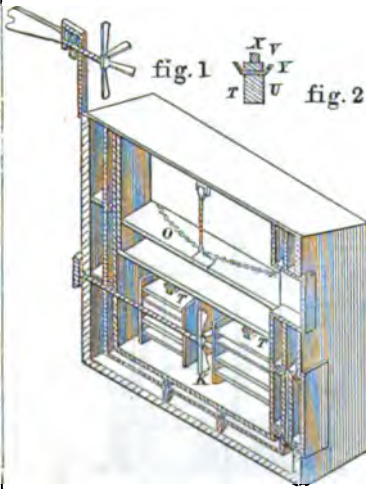
20907



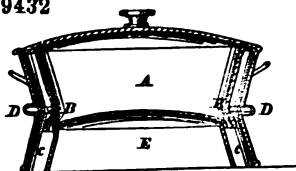
21897



21977



19432



20895

fig. 1

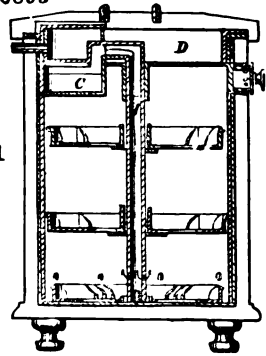
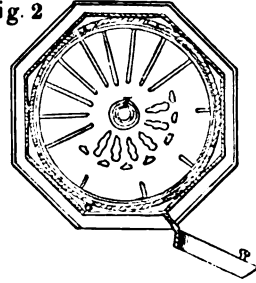
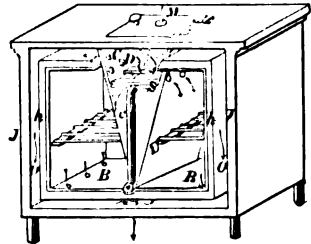


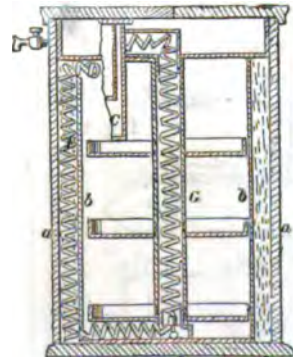
fig. 2



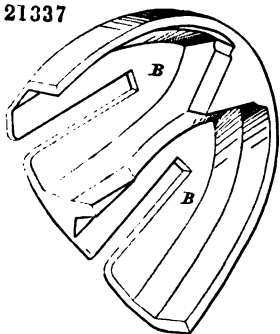
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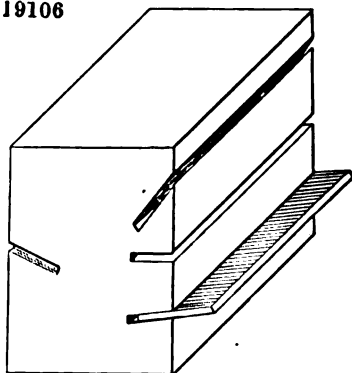
22127



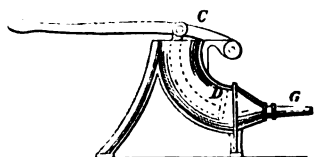
21337



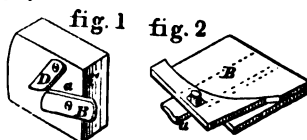
19106



20813



19167



21965

fig. 1

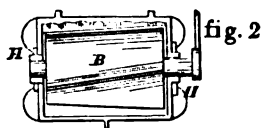
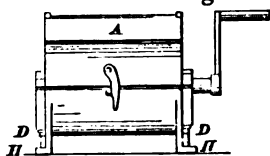


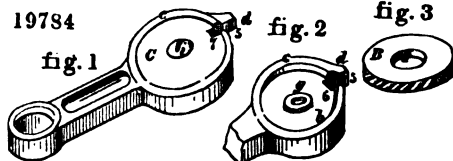
fig. 2

19784

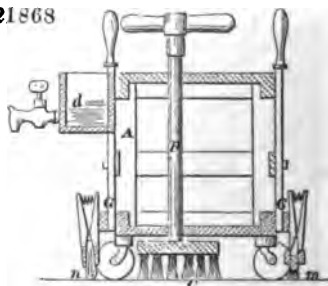
fig. 1

fig. 2

fig. 3



21868



20445

fig. 1

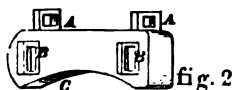
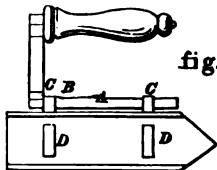


fig. 2

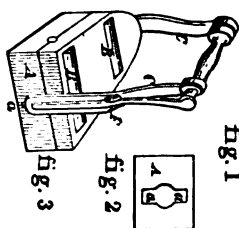


fig. 3



fig. 2

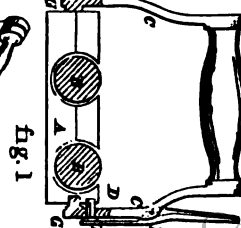
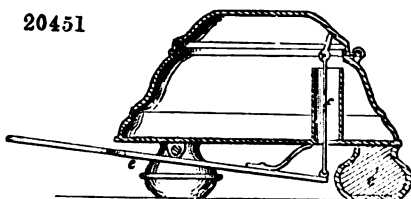


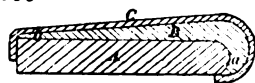
fig. 1

20018

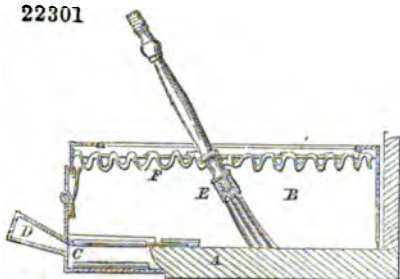
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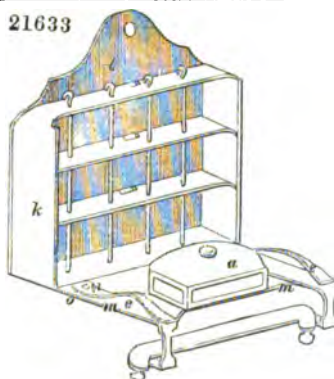
21799



22301



21633



21275

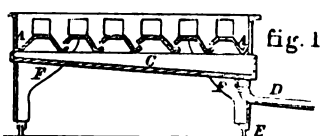


fig. 1

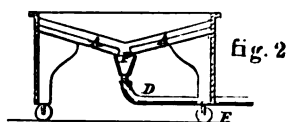


fig. 2

20489

fig. 1

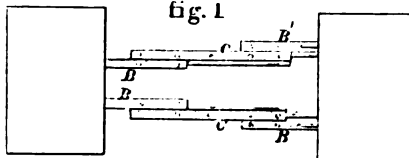


fig. 2

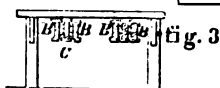


fig. 3

20088

fig. 1

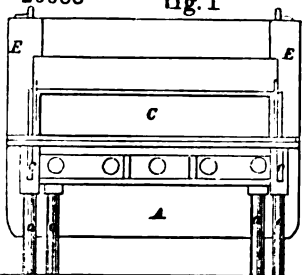


fig. 3

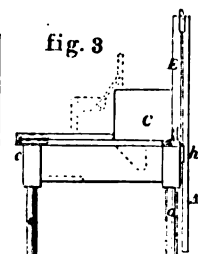
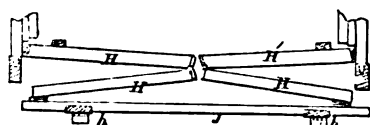


fig. 2



20530

fig. 1

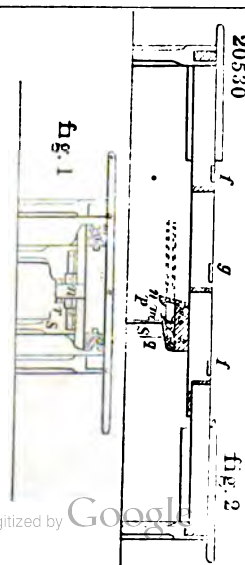


fig. 2

22224

fig. 1

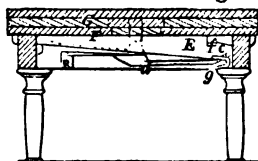
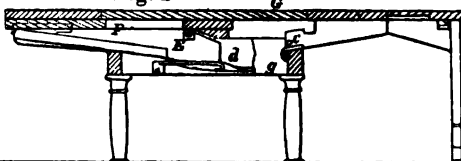
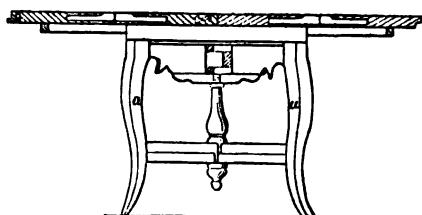


fig. 2



22294



19390

fig. 1

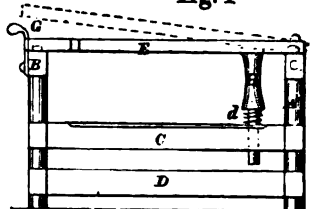
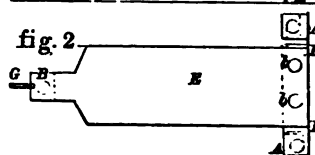


fig. 2



19883

fig. 1

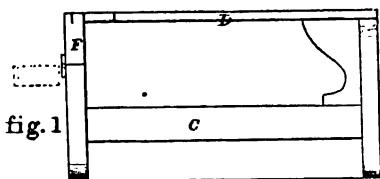
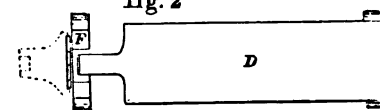


fig. 2



20231

fig. 1

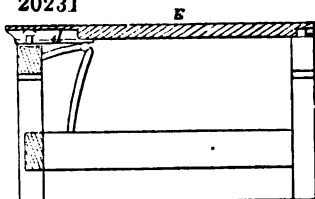
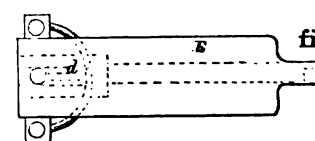


fig. 2



21832

fig. 1

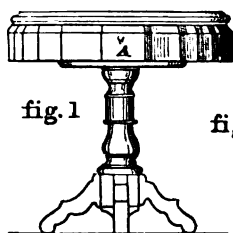
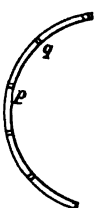
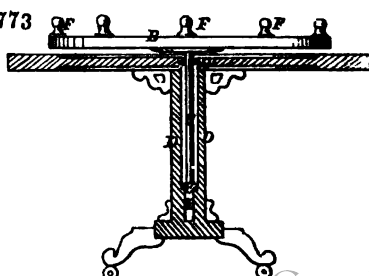


fig. 2



19773



21885

fig. 1

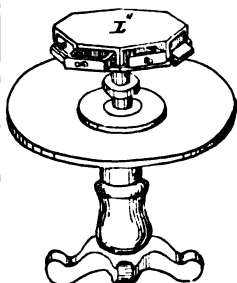
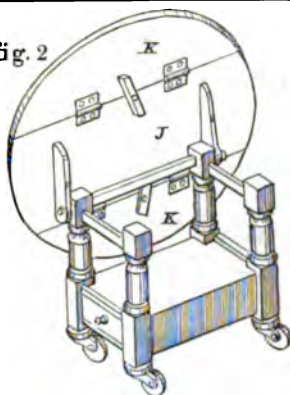
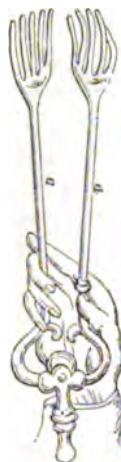


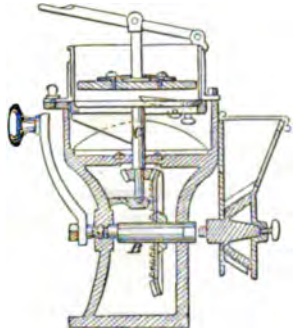
fig. 2



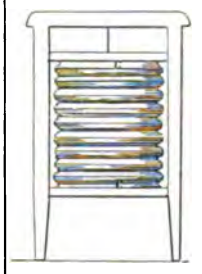
22086



22070



22087



20644

fig. 1

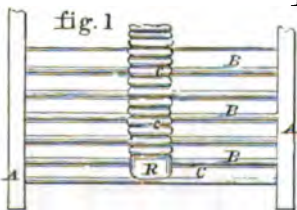


fig. 2

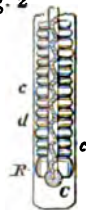
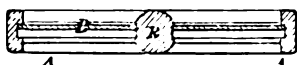
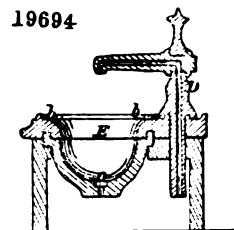


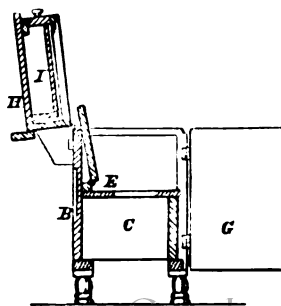
fig. 3



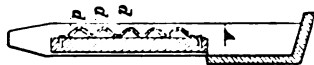
19694



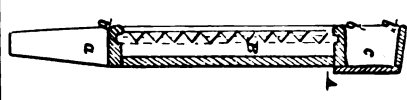
20428



20473

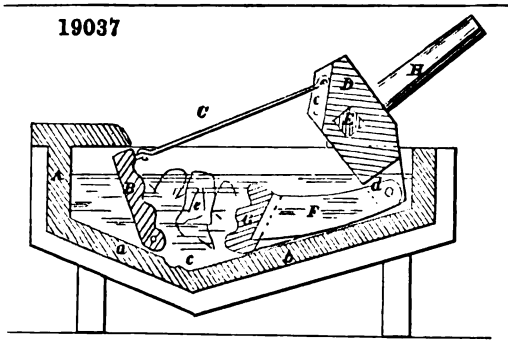


22058





19037



19181

fig. 1

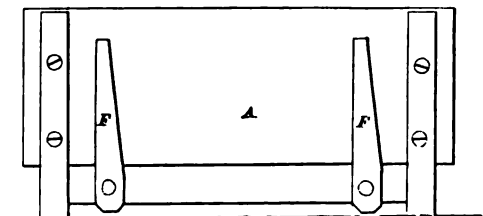
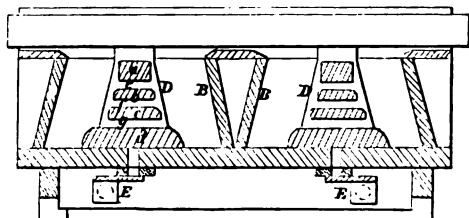


fig. 2



19257

fig. 1

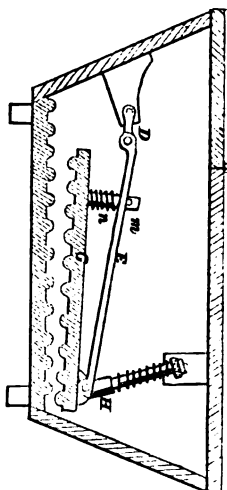
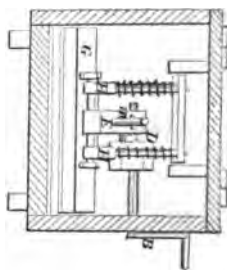


fig. 2



19315

fig. 1

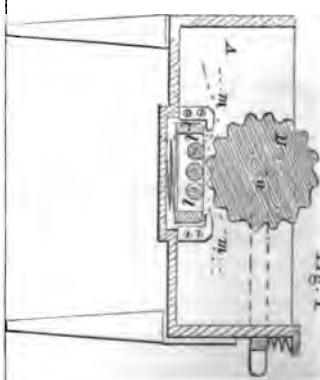
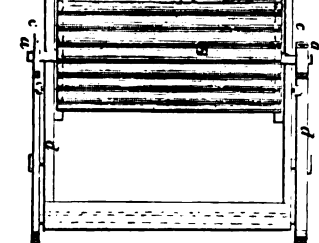
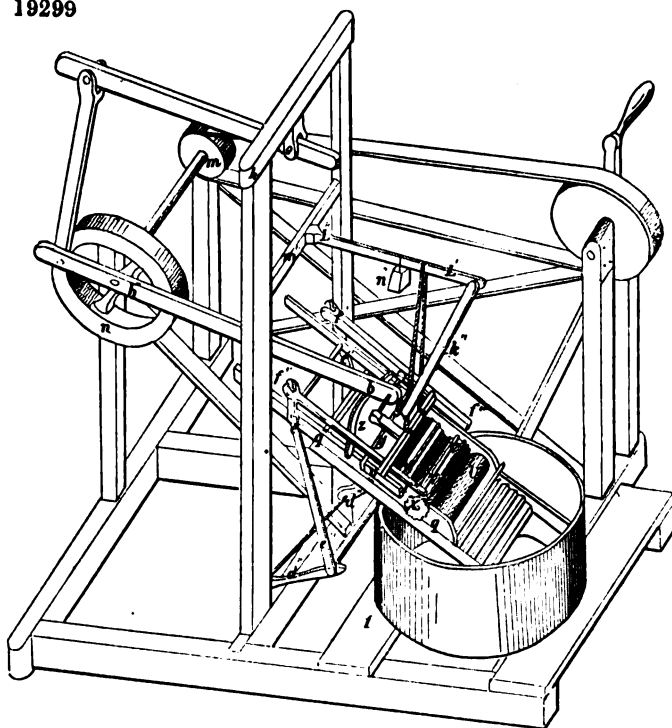


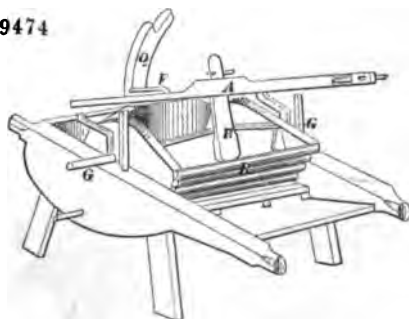
fig. 2



19299



19474



19653

fig. 1

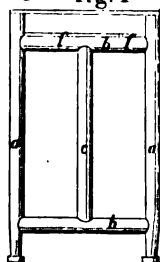
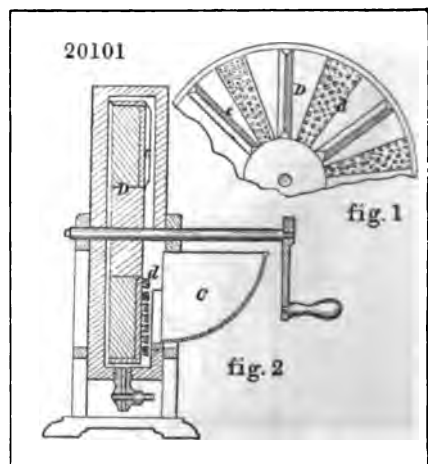
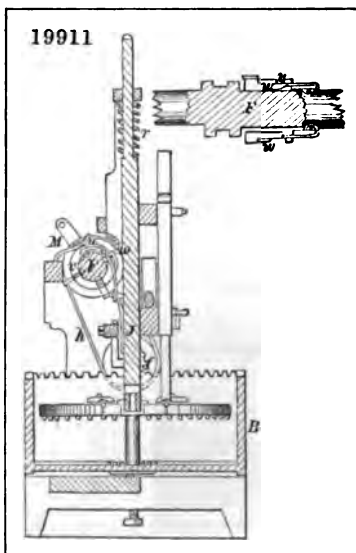
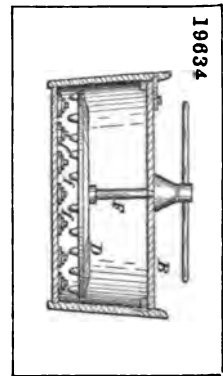
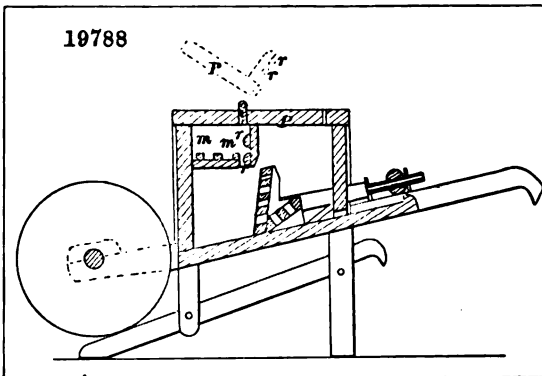
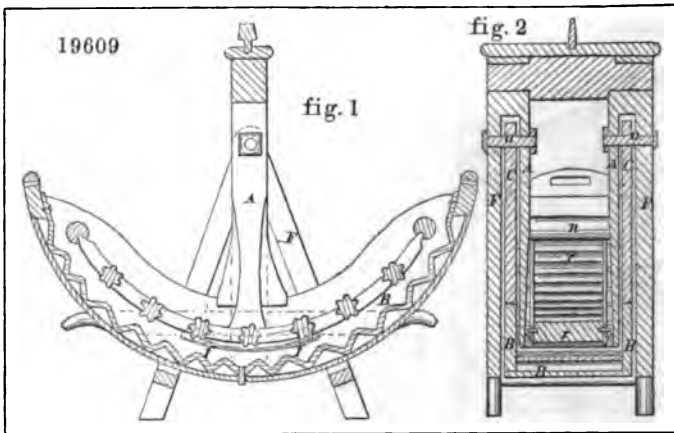


fig. 2

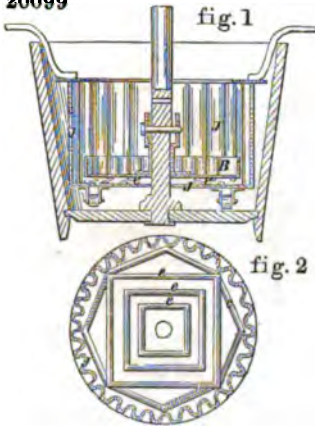


fig. 3

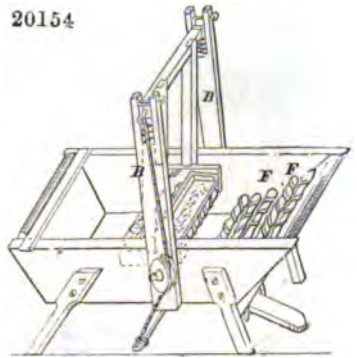




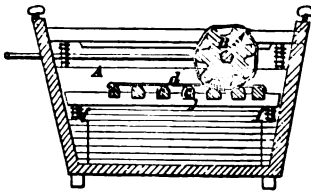
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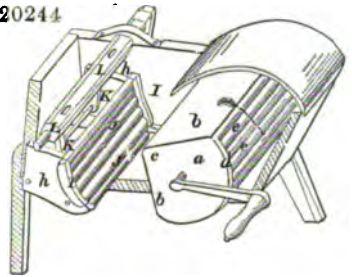
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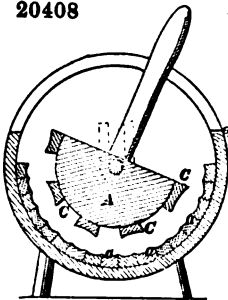
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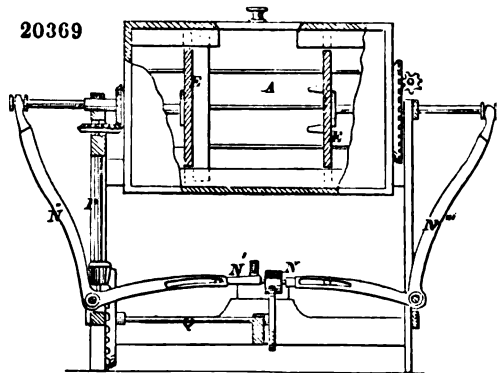
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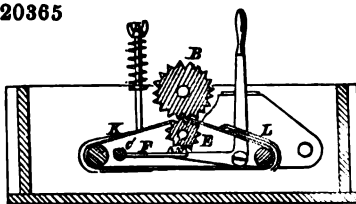
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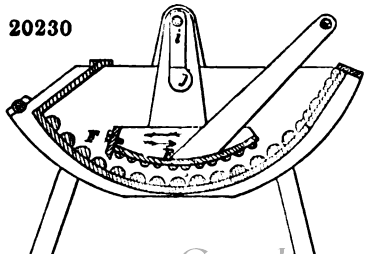
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20365



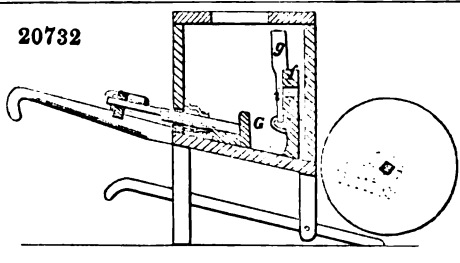
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20182



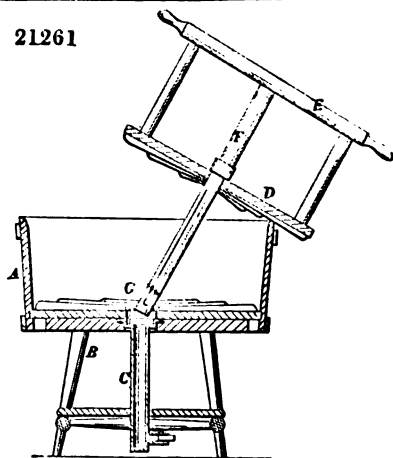
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20791



21261



20574

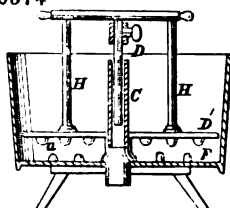


fig. 1

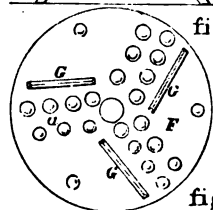
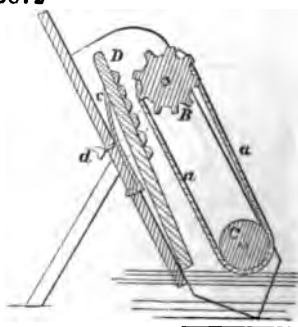
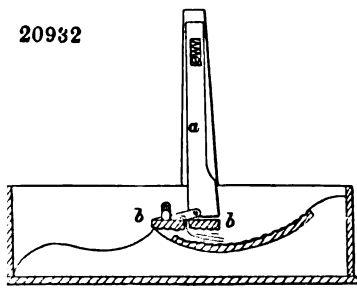


fig. 2

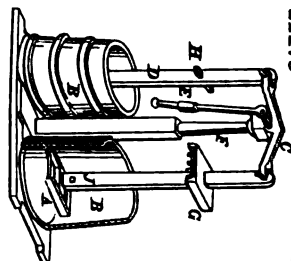
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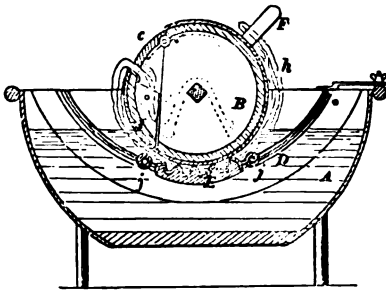
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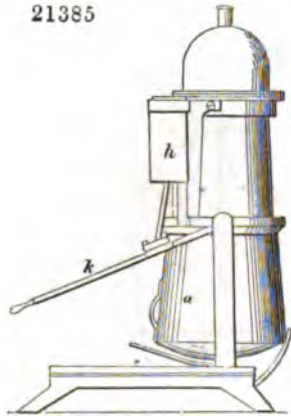
21175



21216



21385



21477

fig. 1

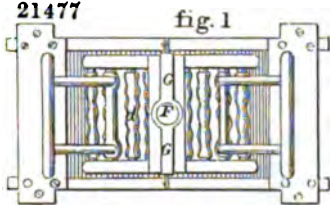


fig. 2

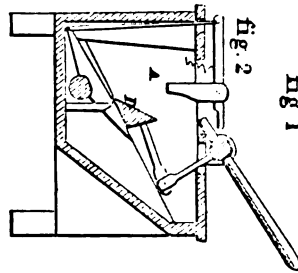
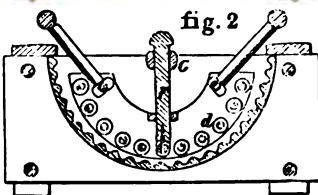
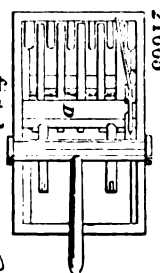


fig. 1



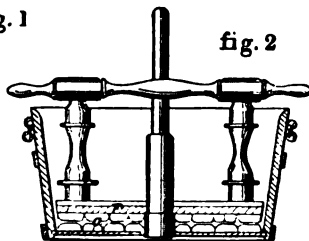
21605

21476

fig. 1



fig. 2



21565

fig. 1

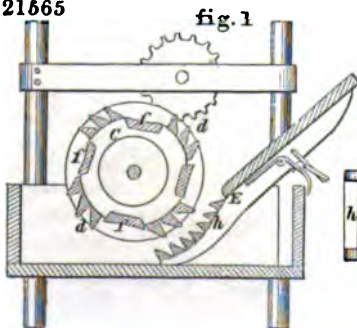
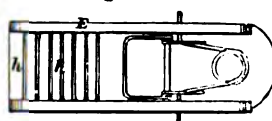
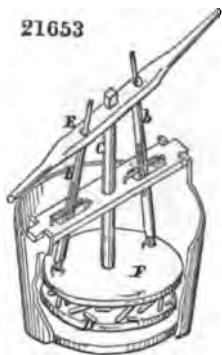


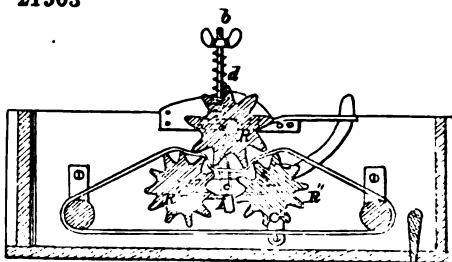
fig. 2



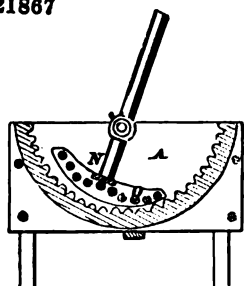
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21903



21867



21875

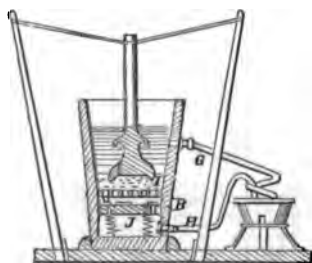


fig. 1

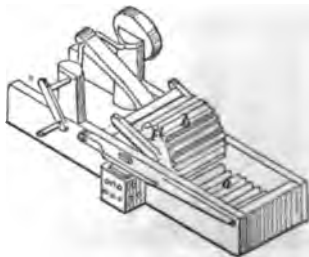
fig. 2



21909



22236



22227

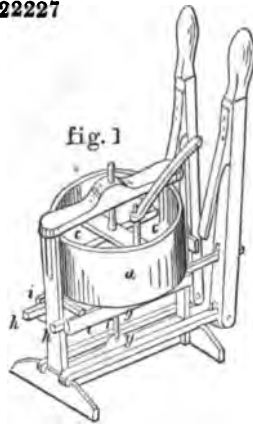
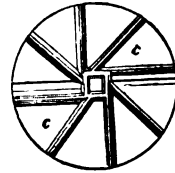
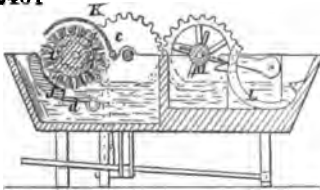


fig. 1

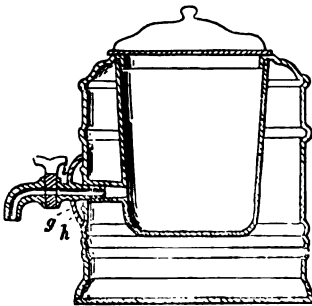
fig. 2



22461



21819

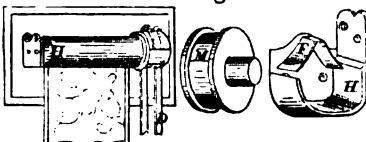


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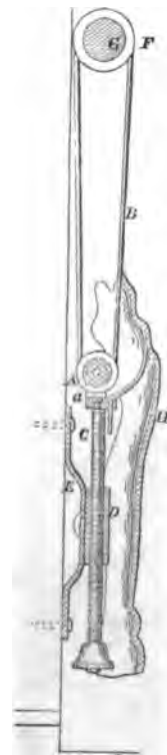
fig. 1

fig. 2

fig. 3

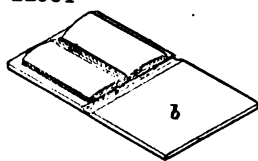


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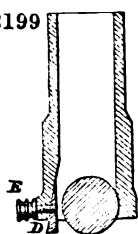




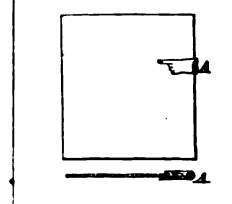
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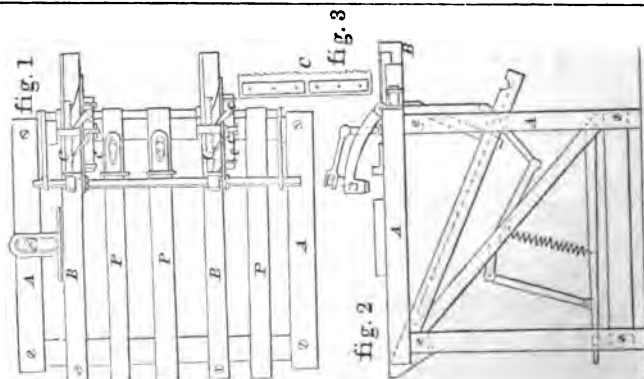
22199



21759



21708



19046

fig. 1

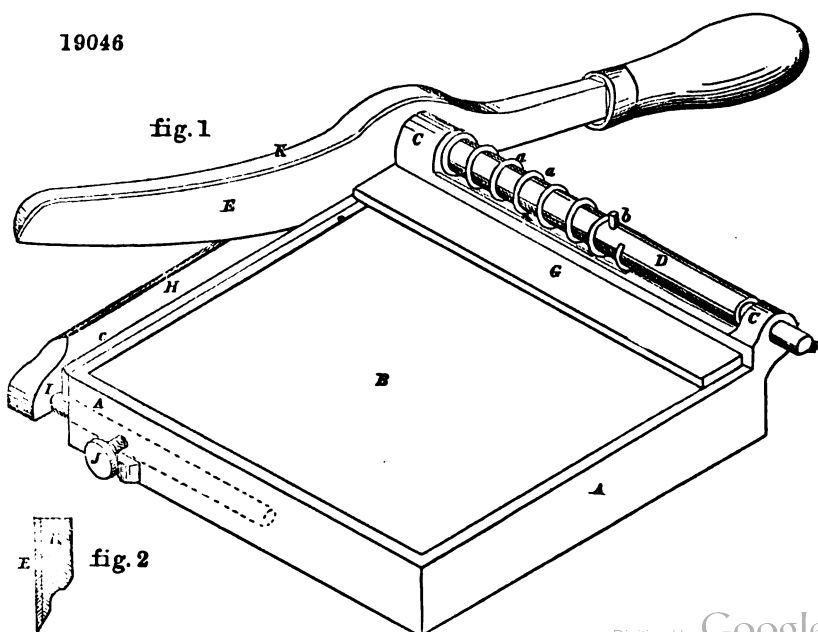
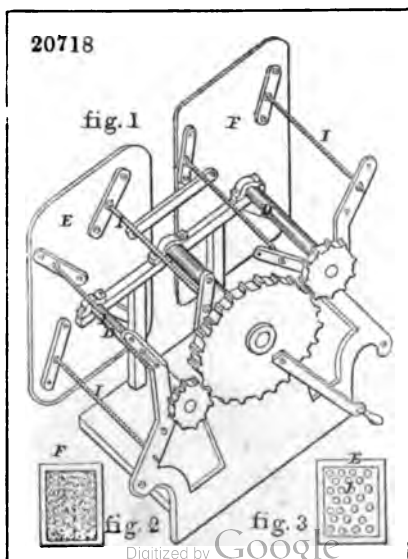
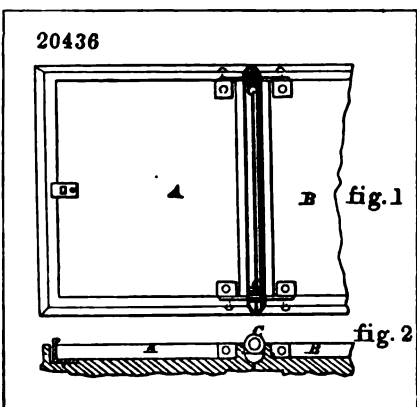
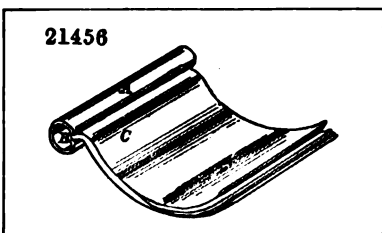
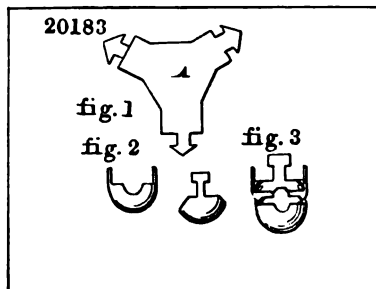
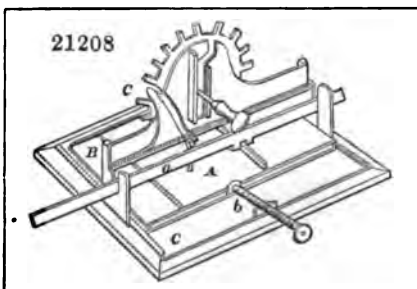
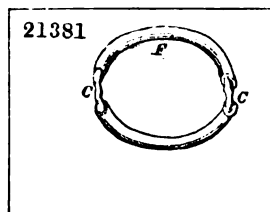
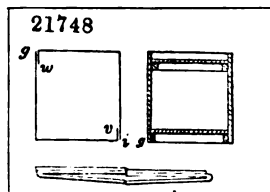
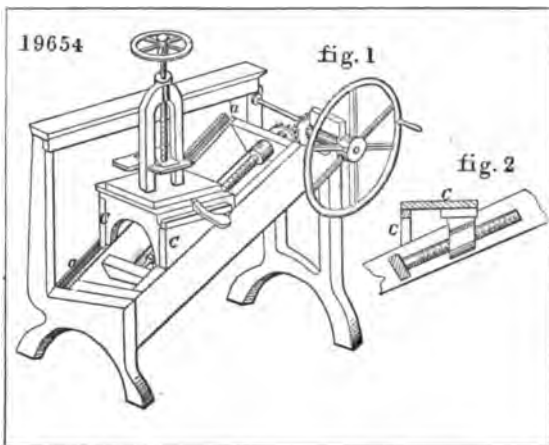
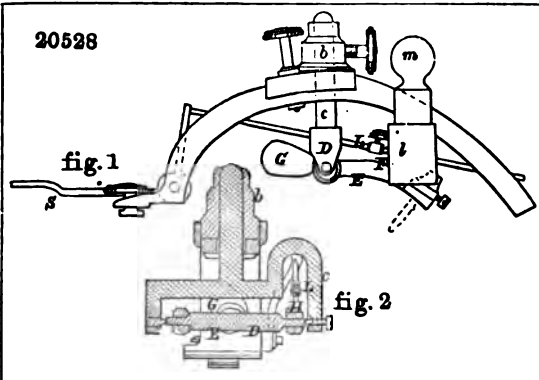


fig. 2

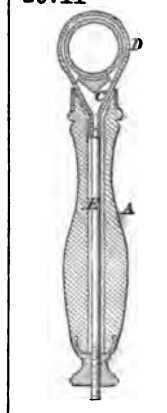




20528



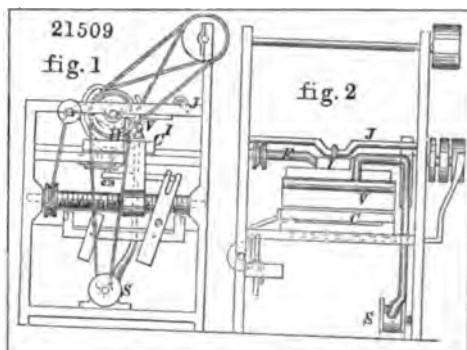
20711



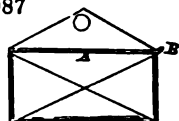
21509

fig. 1

fig. 2



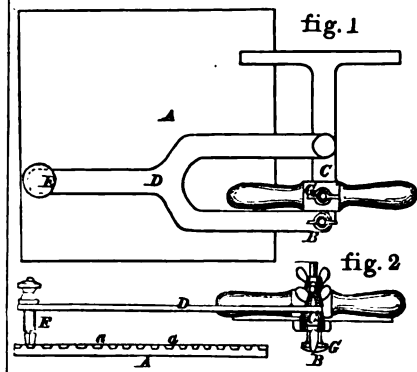
20087



19607

fig. 1

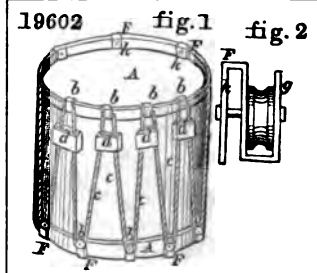
fig. 2



19602

fig. 1

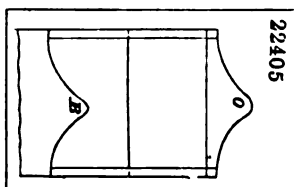
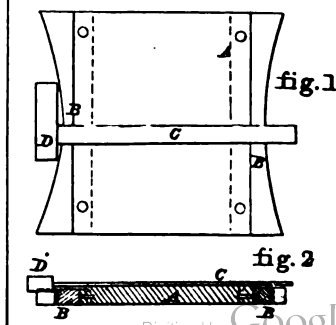
fig. 2



21336

fig. 1

fig. 2



22405

22149

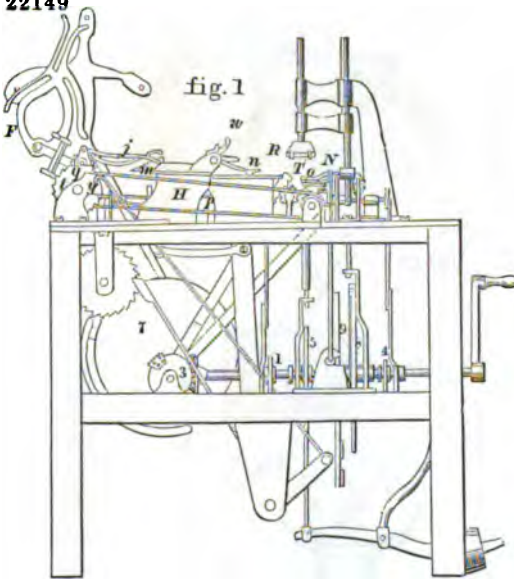
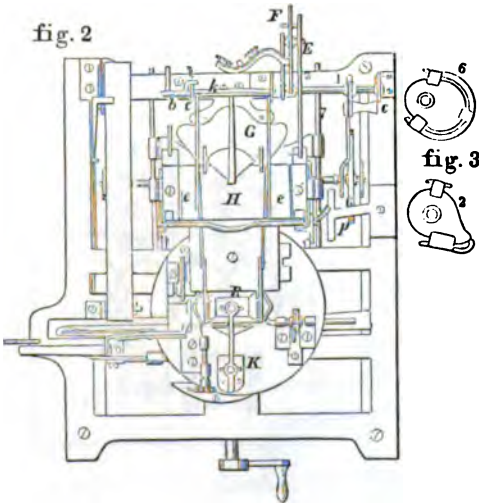
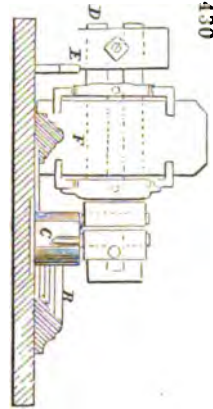


fig. 2



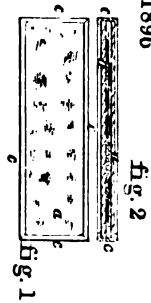
21430



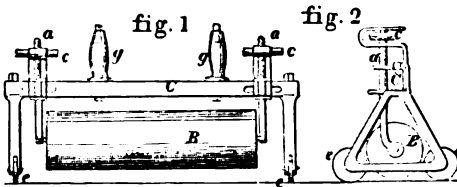
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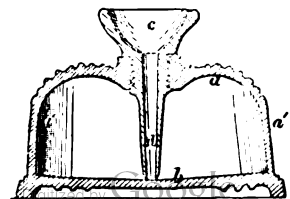
21896



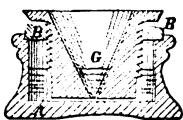
20710



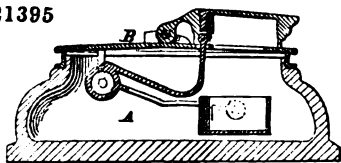
19613



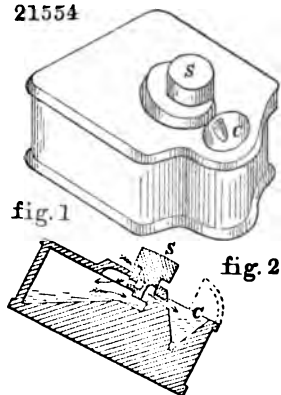
20028



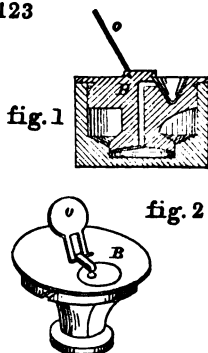
21395



21554



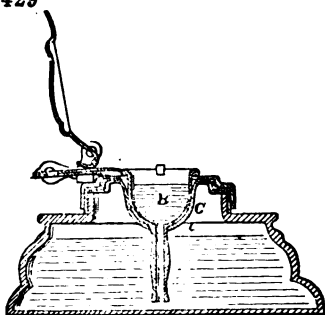
22123



19783

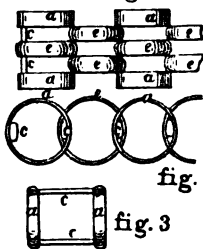


22429

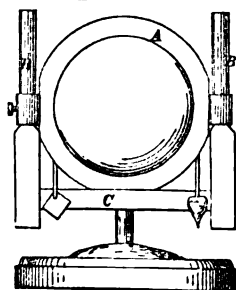


19497

fig. 1

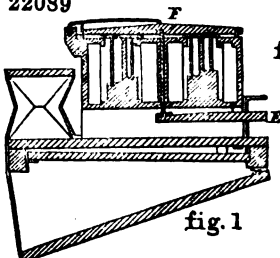


19624

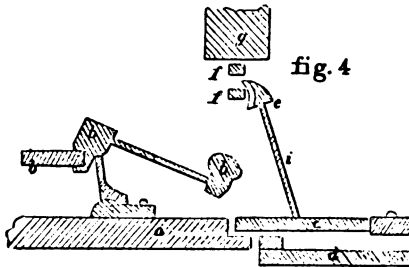
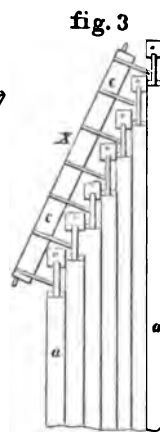
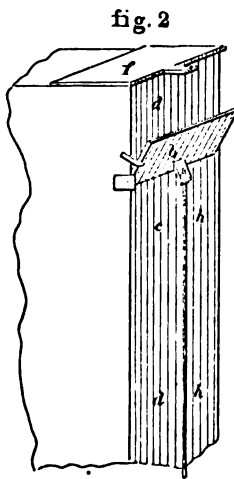
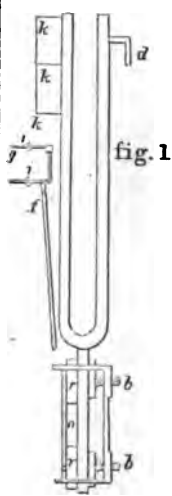


22089

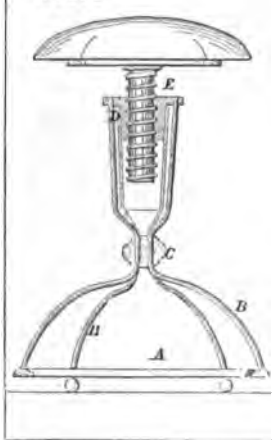
fig. 2



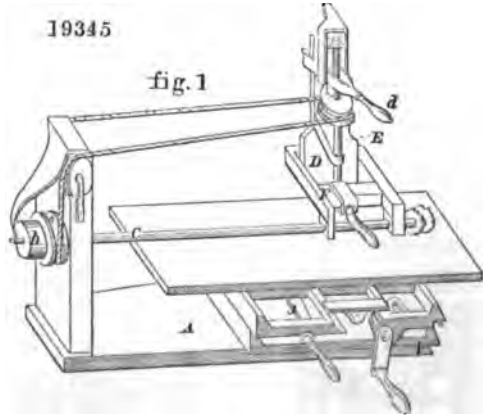
19296



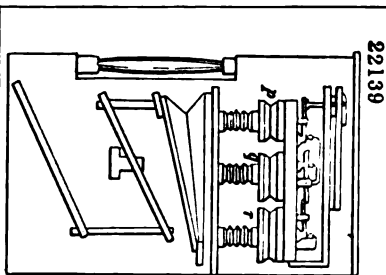
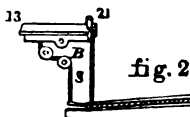
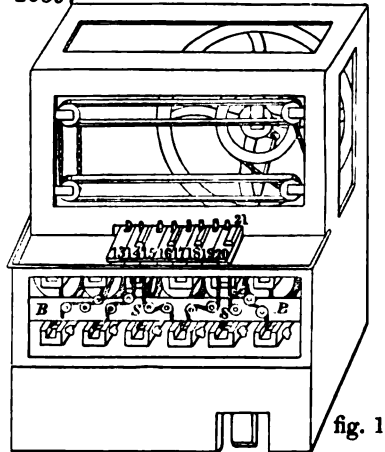
21262



19345

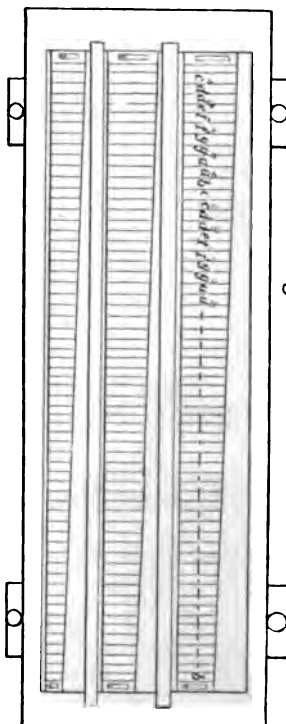


20397



22139

fig. 2



19187

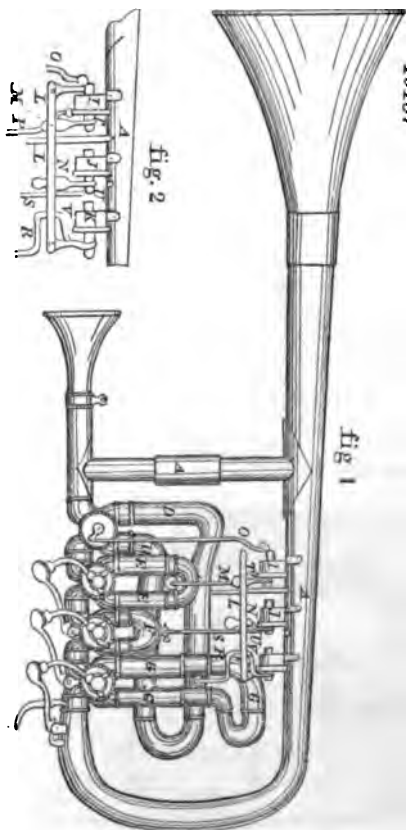
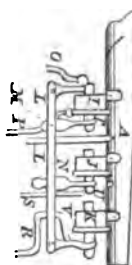


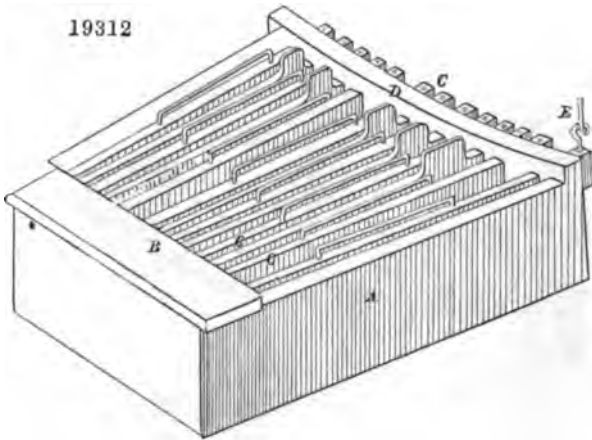
fig. 2



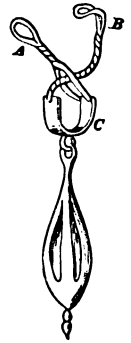
19814



19312



20480



19316

fig. 1

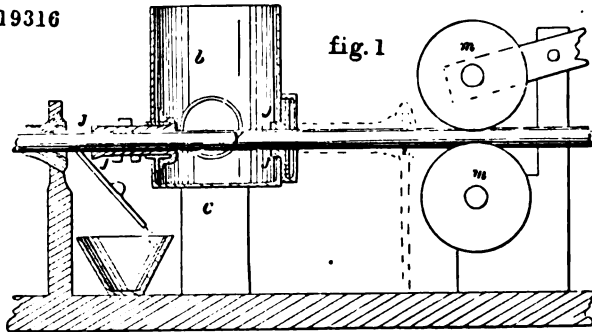
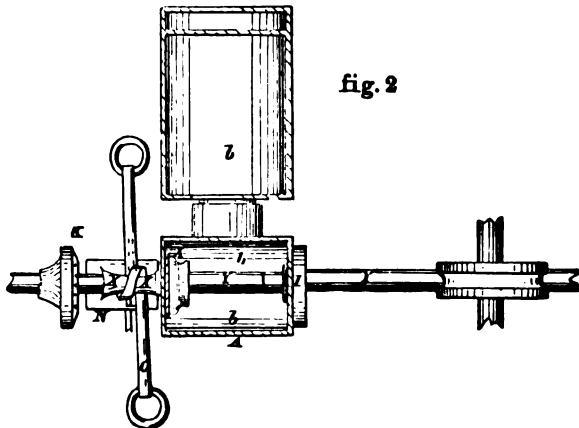


fig. 2





19506

fig. 1

fig. 3

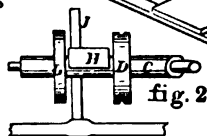
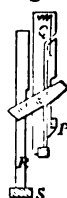
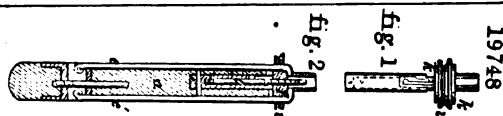
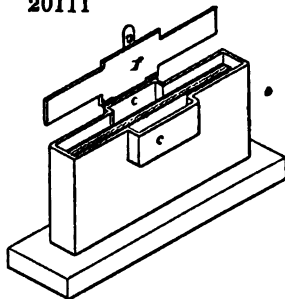


fig. 2

20111



19748

fig. 1

fig. 2

21657

fig. 1

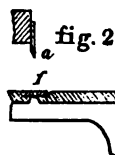
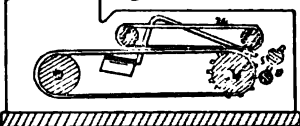


fig. 2

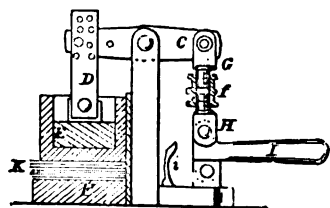
20838

fig. 1

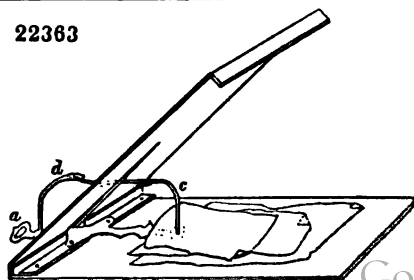
fig. 2



21775



22363



20985

fig. 1

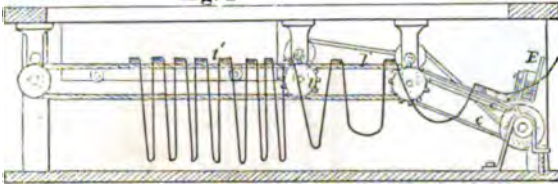
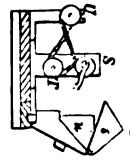
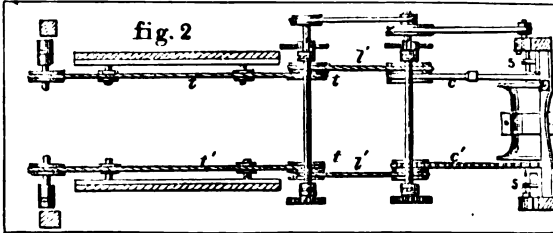


fig. 2



21710  
fig. 1

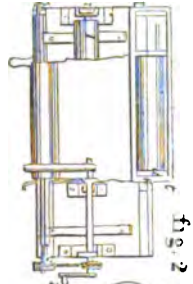


fig. 2

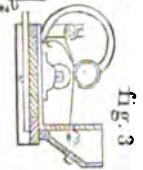


fig. 3

20858

fig. 1

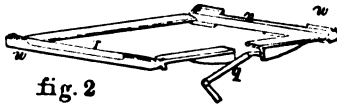
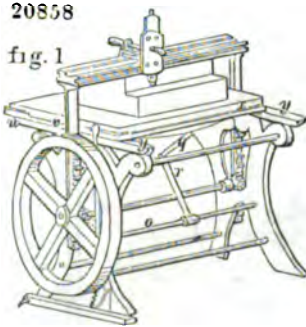


fig. 2

20077

fig. 1

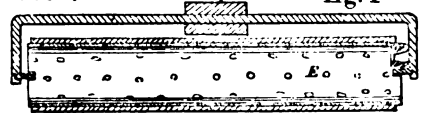
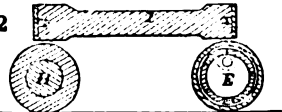


fig. 2



21172

fig. 1

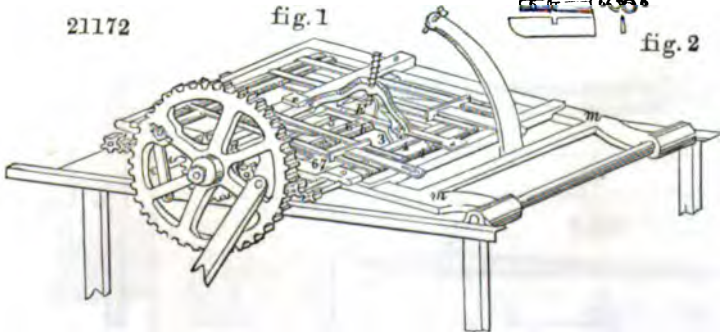
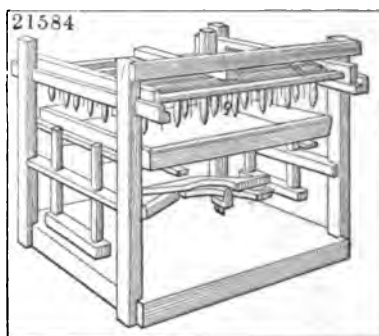
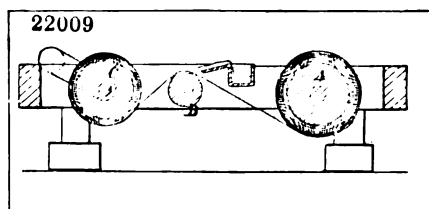


fig. 2



21411 fig. 1

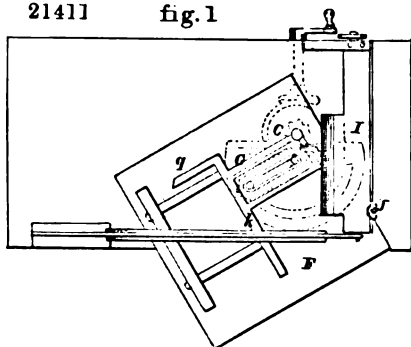
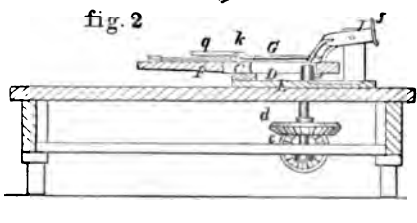
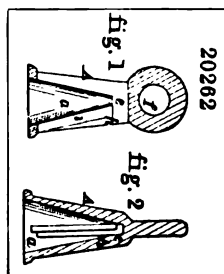
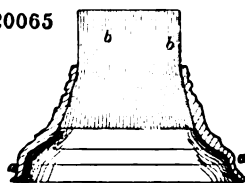


fig. 2



20065



22017



19831

fig. 1

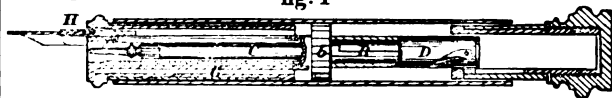


fig. 2



20741



21881

fig. 1

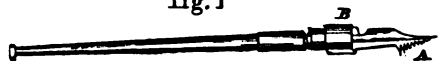
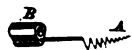
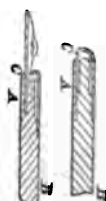


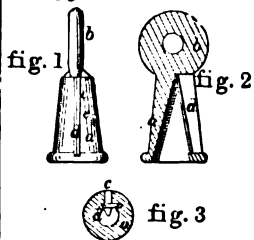
fig. 2



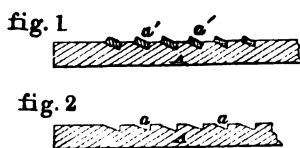
21758



20056



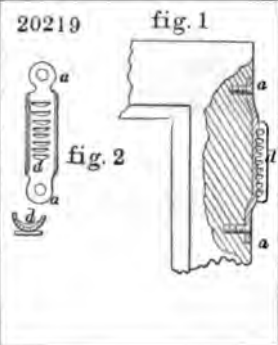
19191



21649



20219



21079

fig. 1

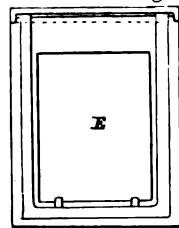
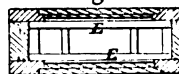


fig. 2



21470

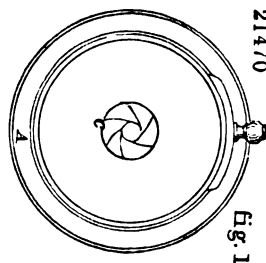


fig. 1

19252

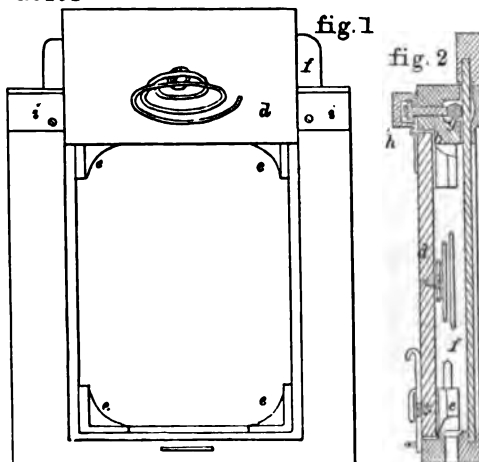


fig. 2

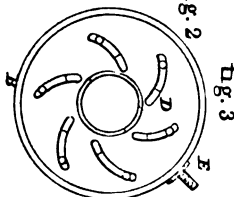
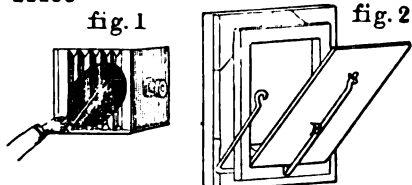


fig. 3

22158



20401

fig. 1

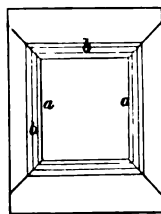
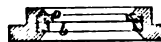
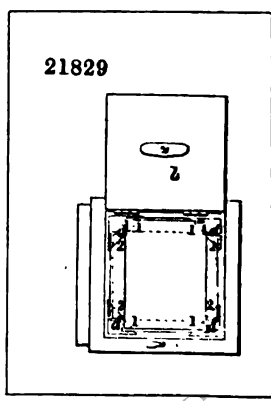
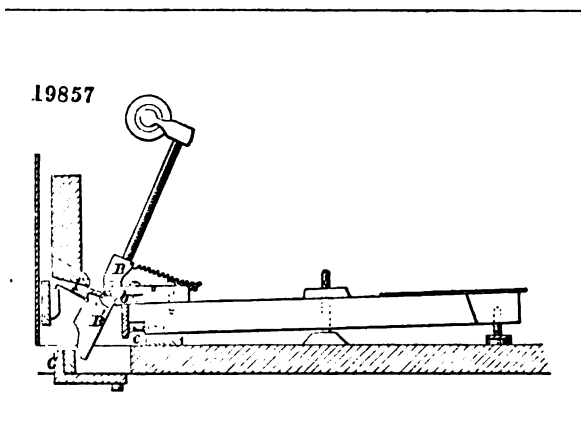
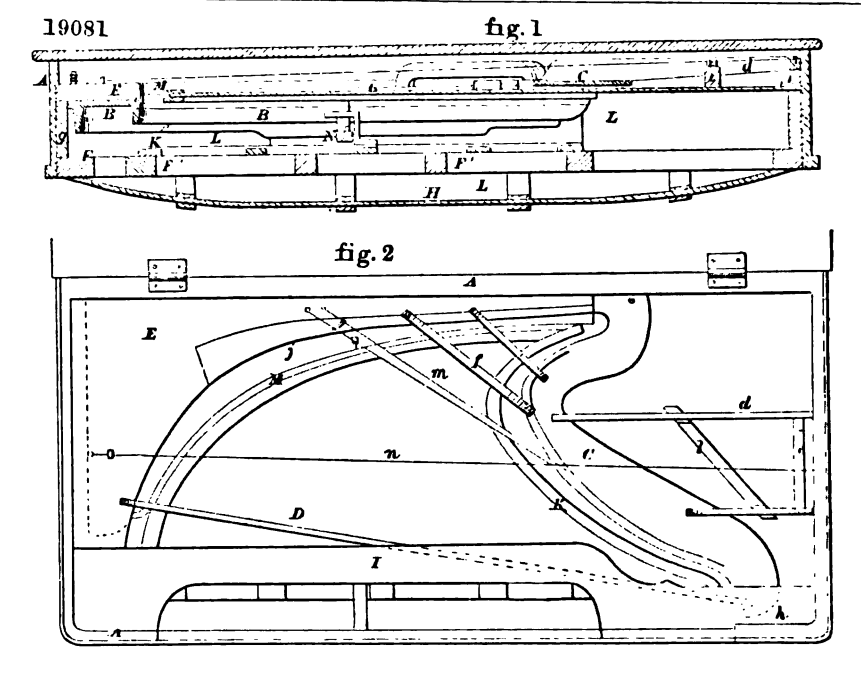
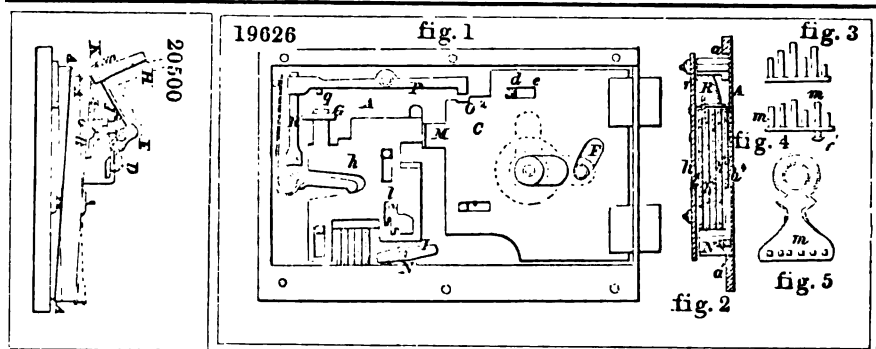
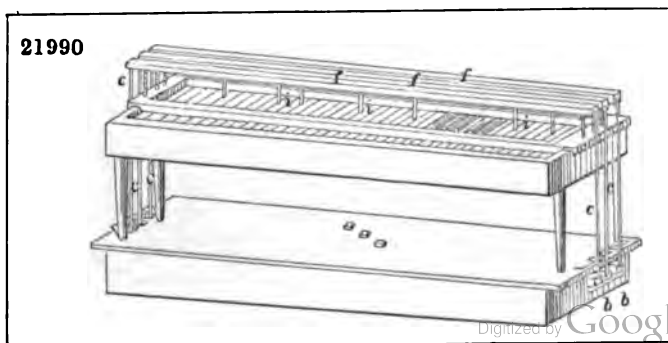
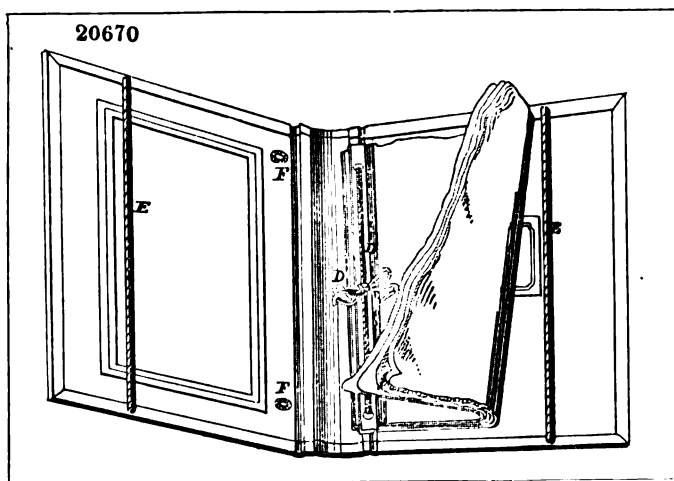
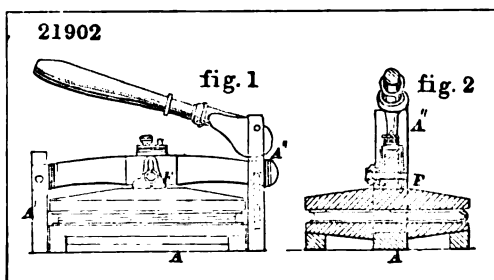
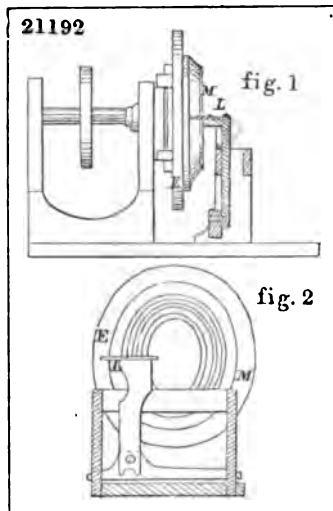
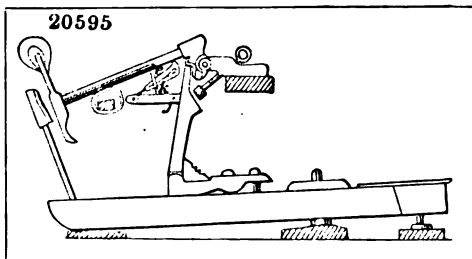


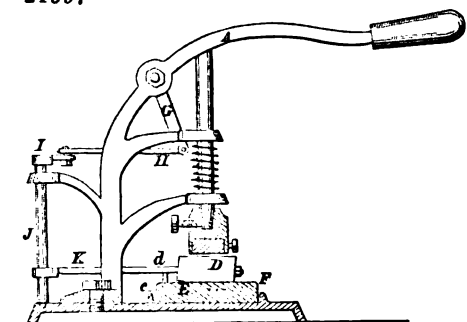
fig. 2



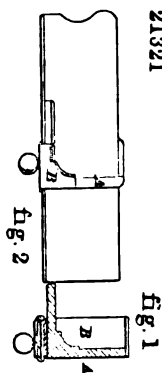




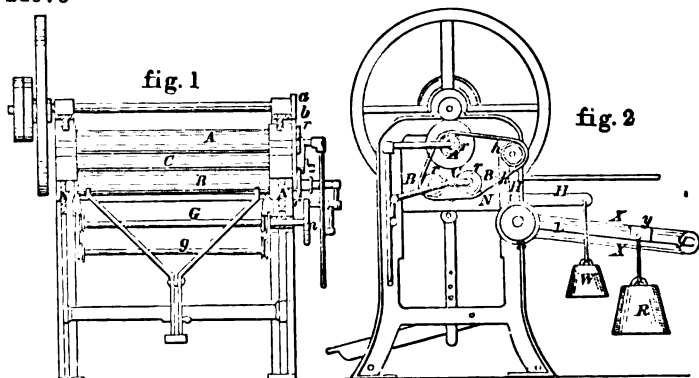
21997



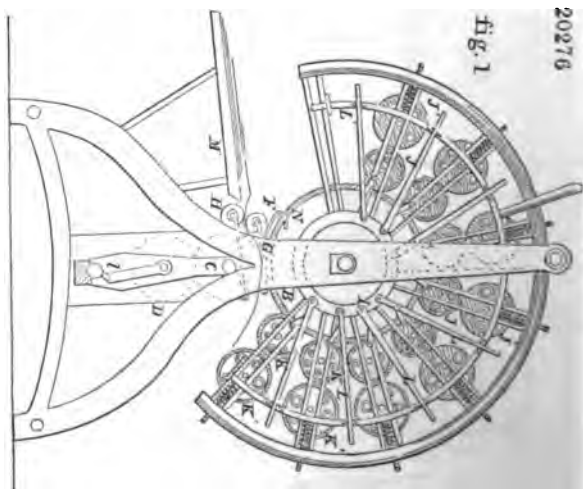
21321



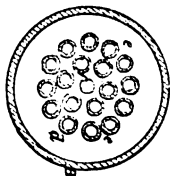
21976

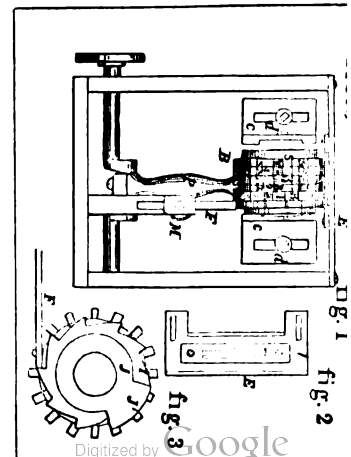
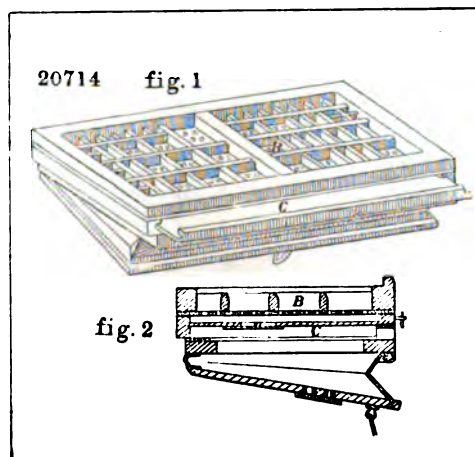
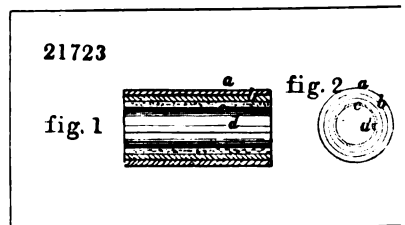
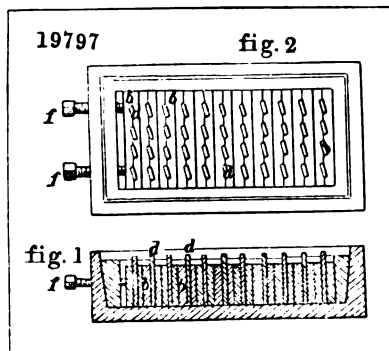
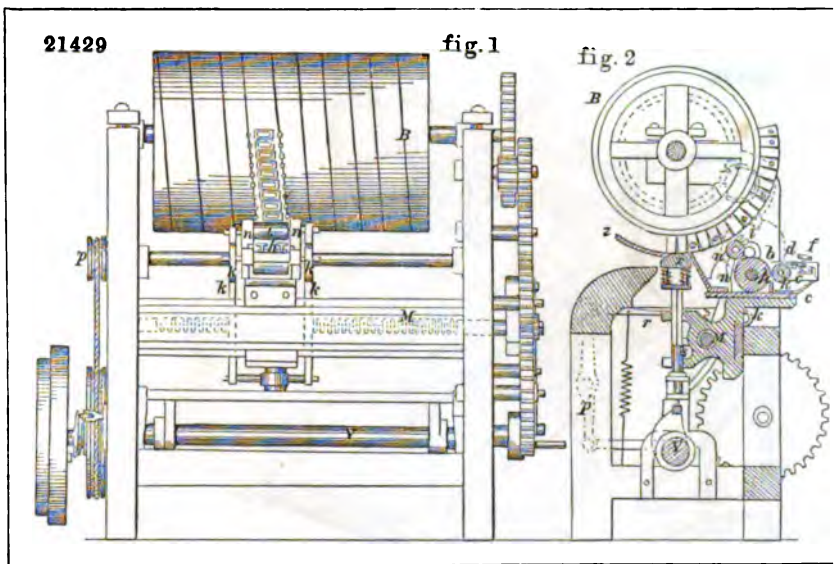


20276



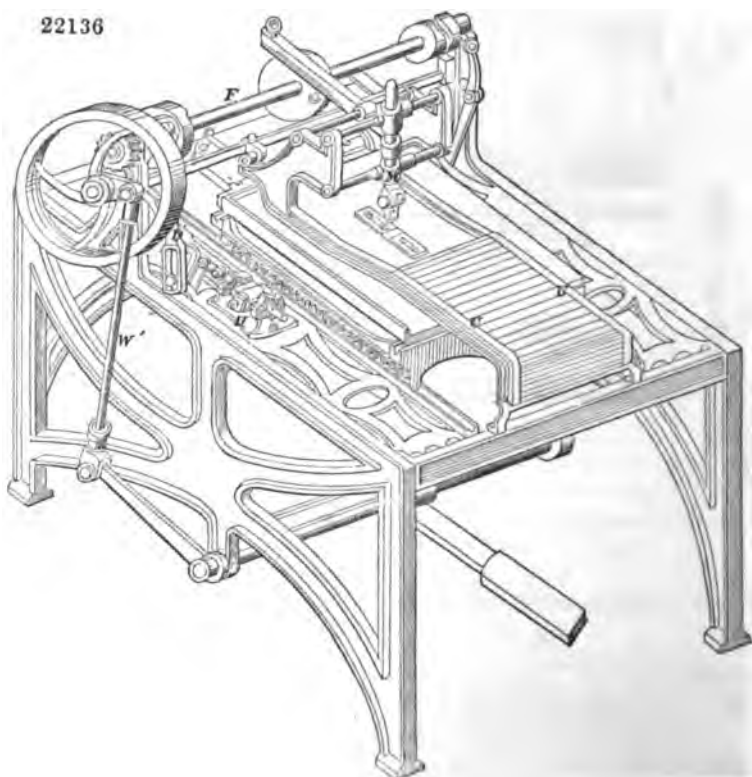
**Fig. 2**



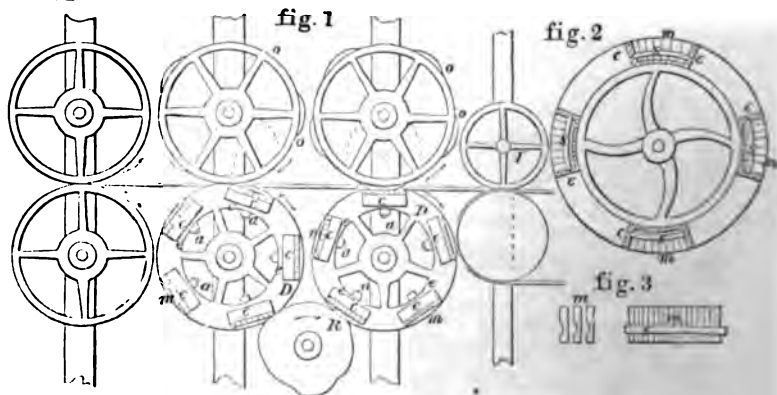




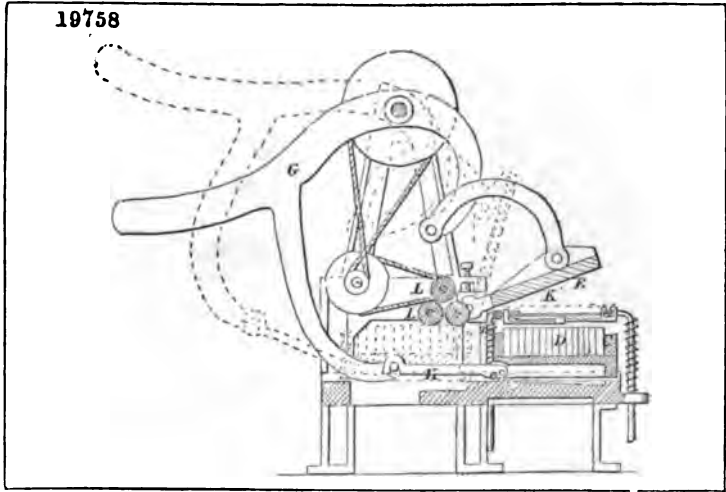
22136



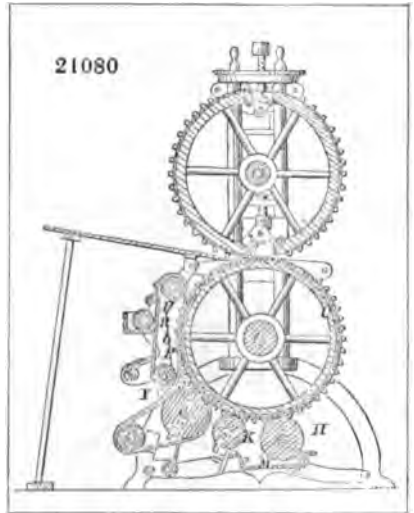
19672



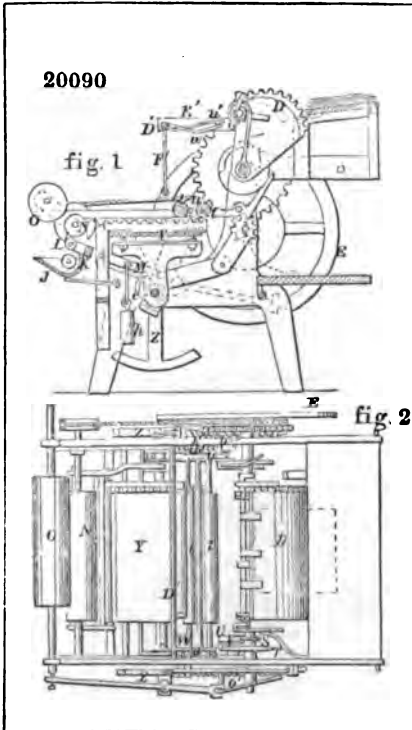
**19758**



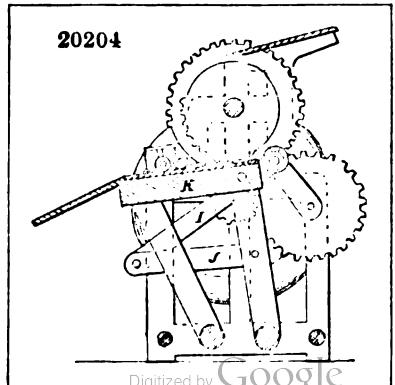
21080

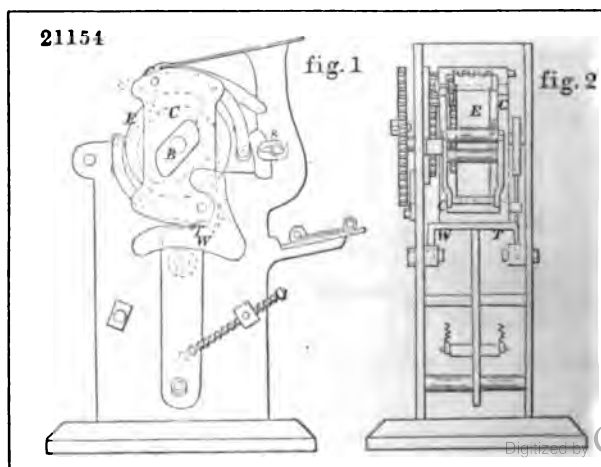
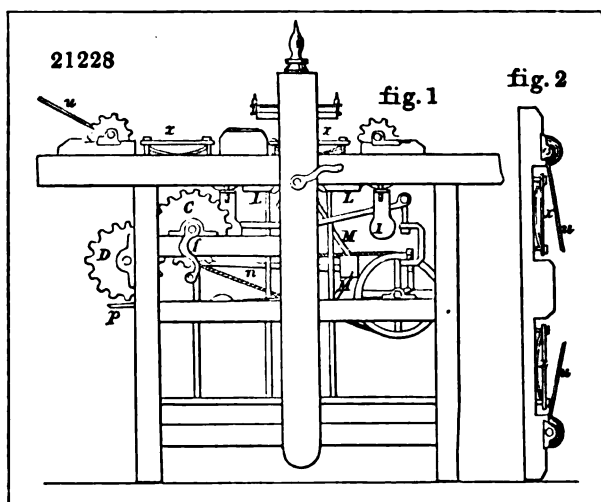
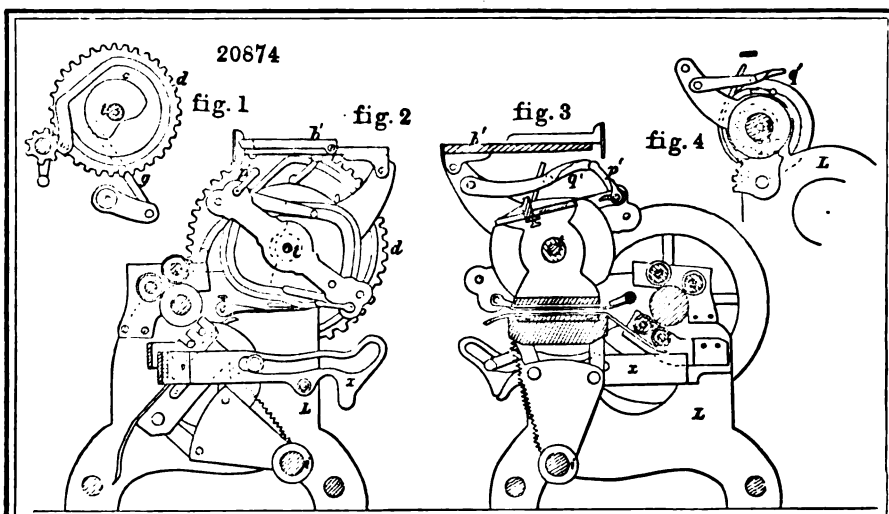


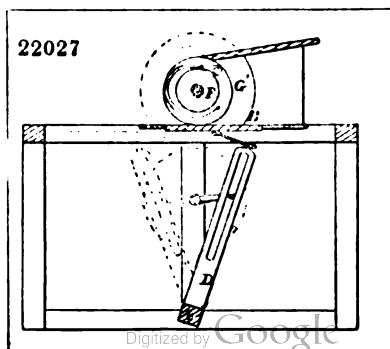
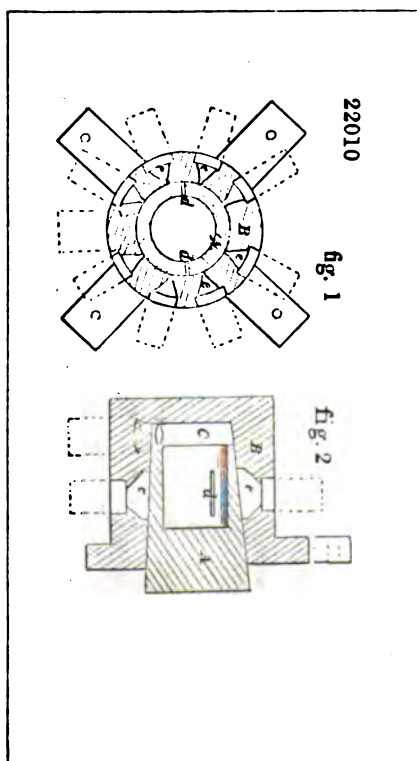
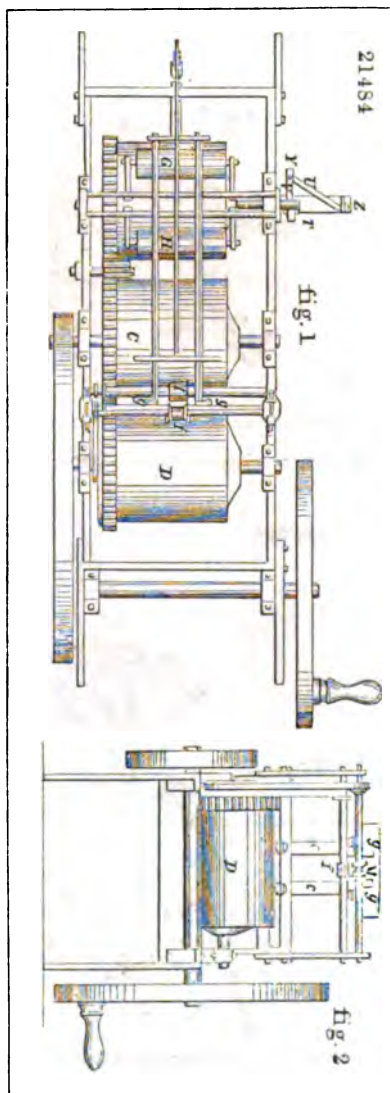
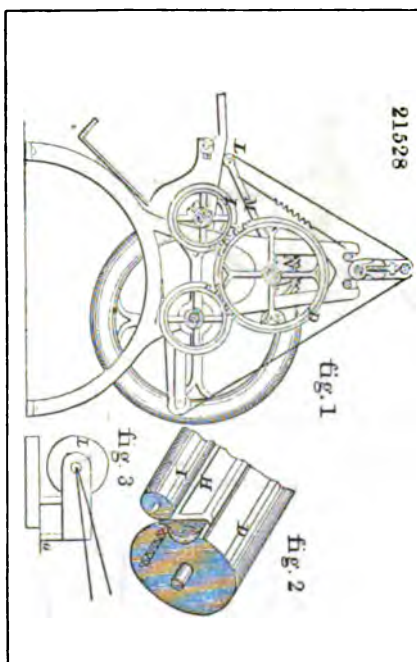
20090



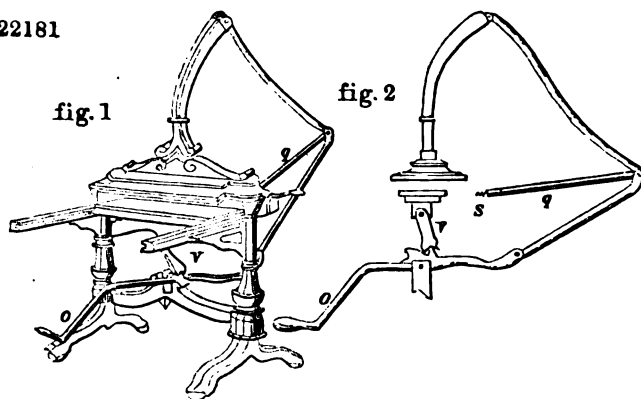
**20204**



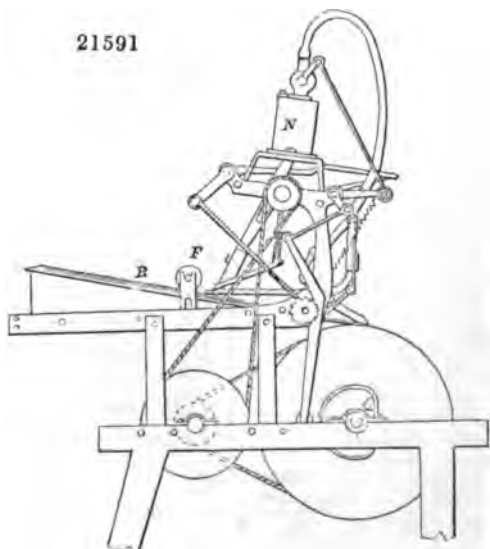




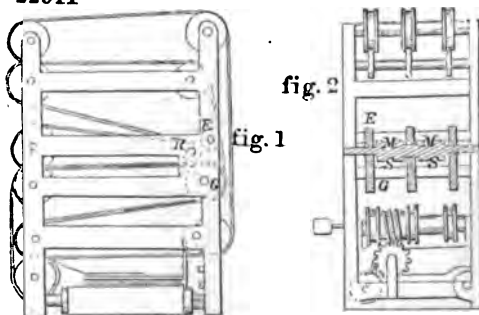
22181



21591



22011



22414

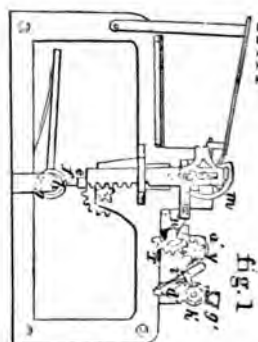


fig. 1

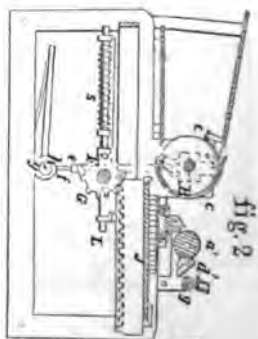


fig. 2

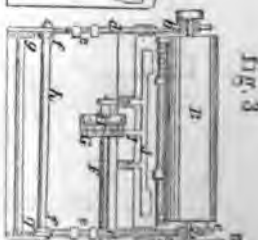


fig. 3

21980

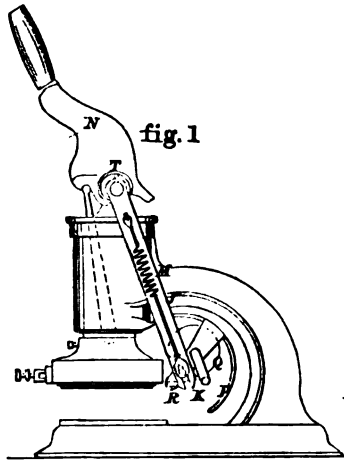
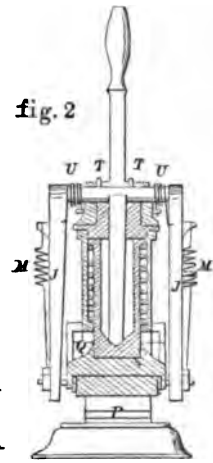


fig. 1

fig. 2



21859  
fig. 1

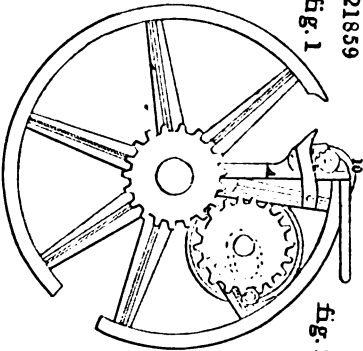
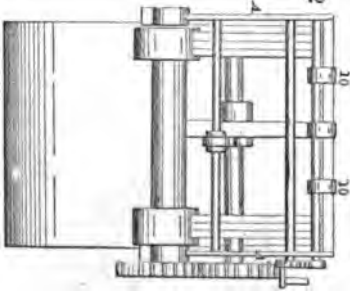


fig. 2



20039

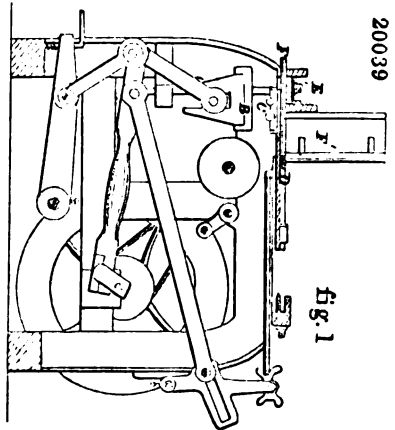


fig. 1

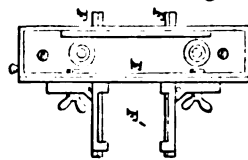
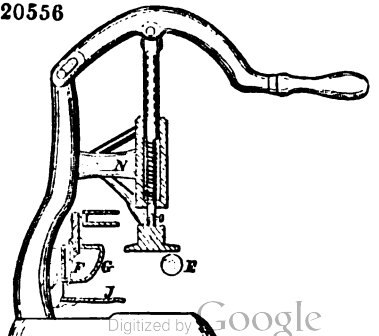


fig. 2

20556



20179

fig. 1

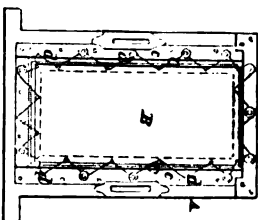
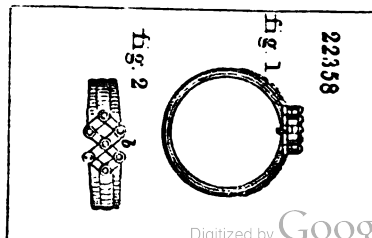
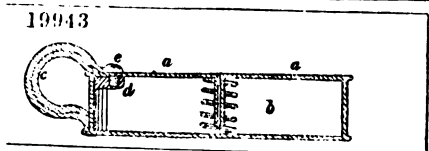
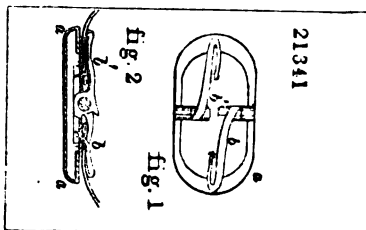
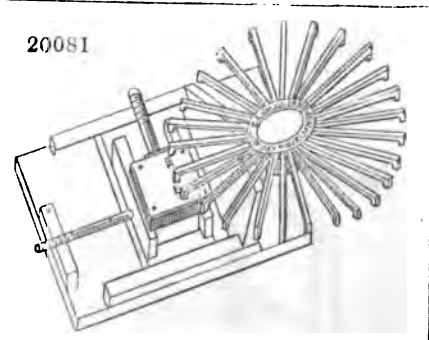
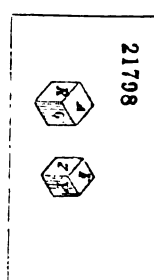
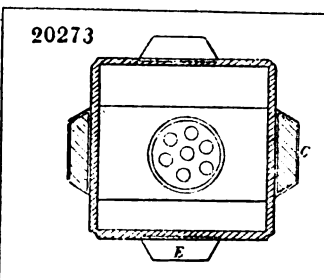
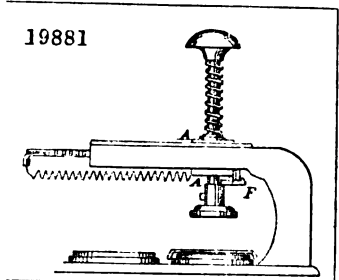
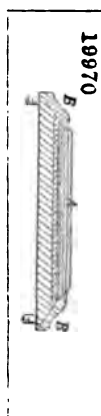
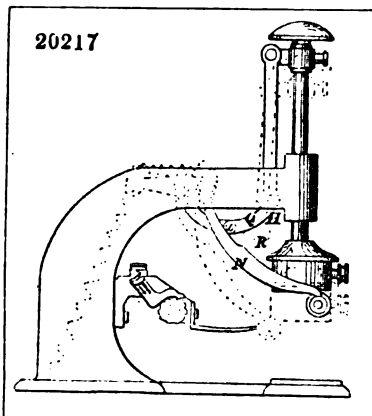
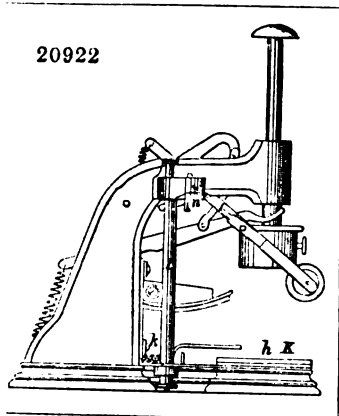
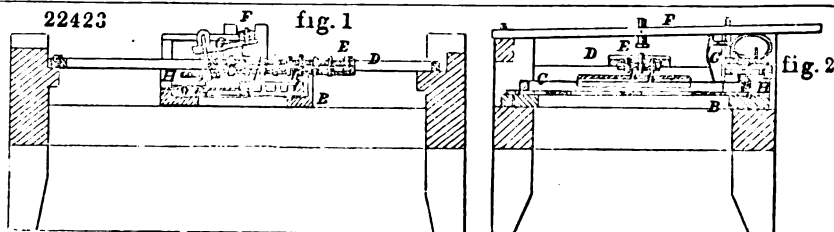
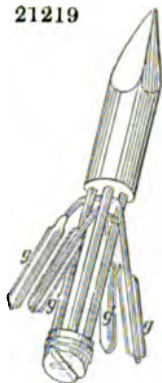


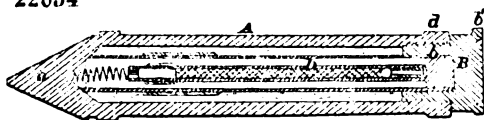
fig. 2



21219



22054



21505

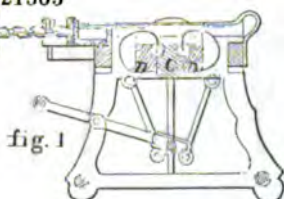
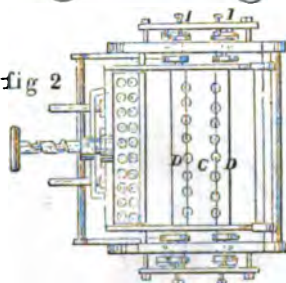
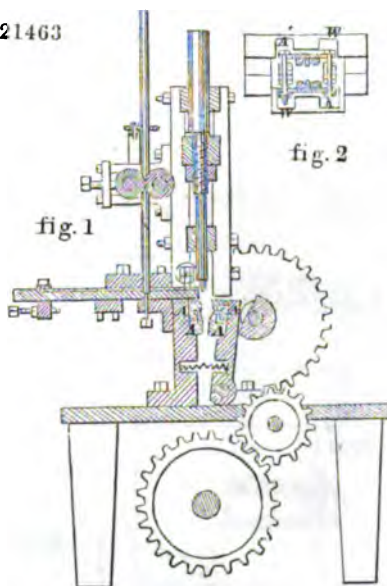


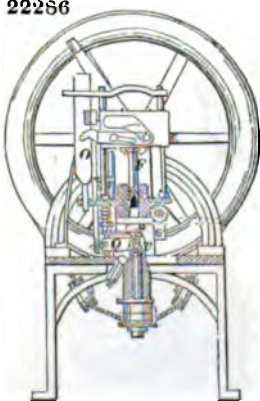
fig 2



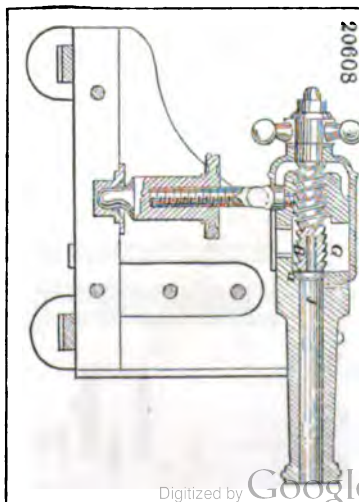
21463



22286

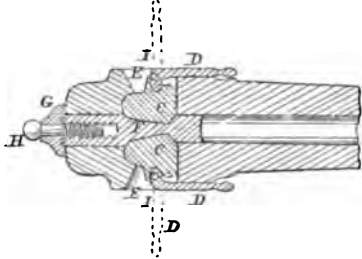


20608





22299



22427

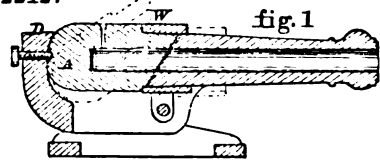


fig. 1

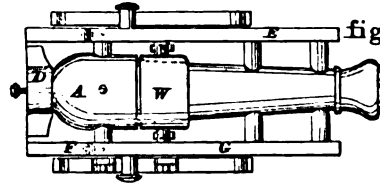


fig. 2

21253

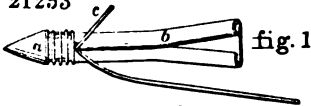


fig. 1



fig. 2

20727

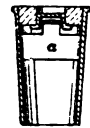


fig. 1

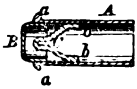


fig. 2

fig. 3



20214



19327

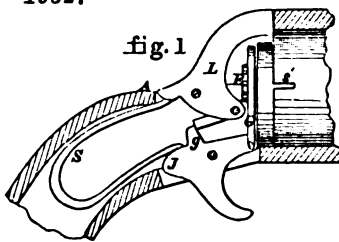
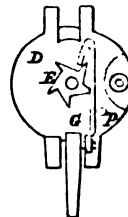


fig. 1

fig. 2



22325

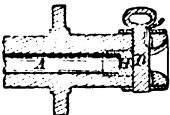


fig. 1



fig. 2

20041

fig. 1

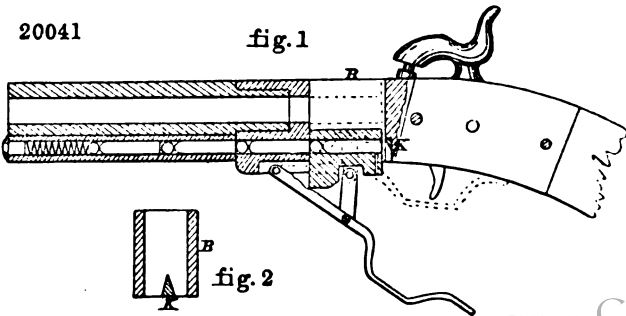
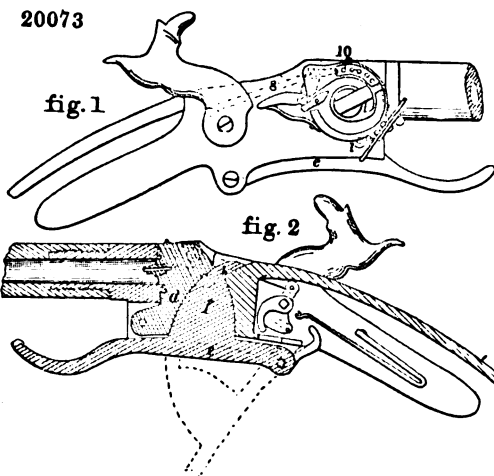
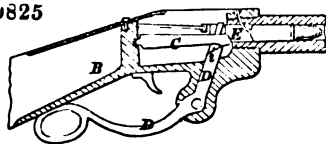


fig. 2

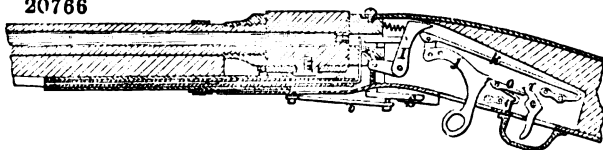
20073



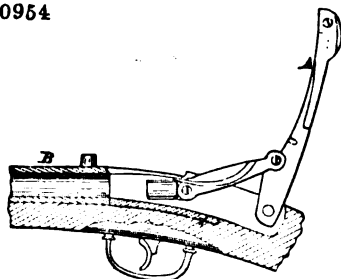
20825



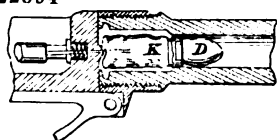
20766



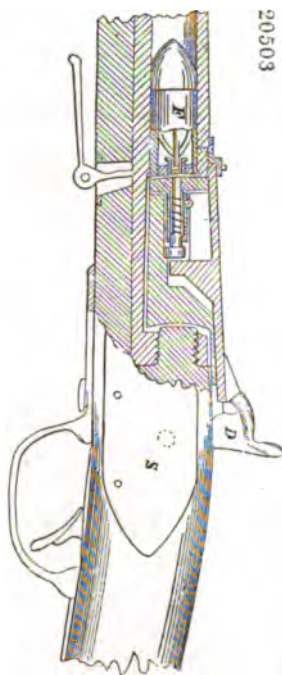
20954



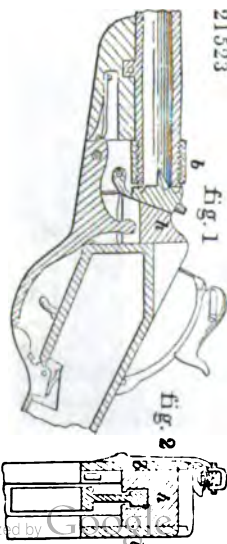
22094



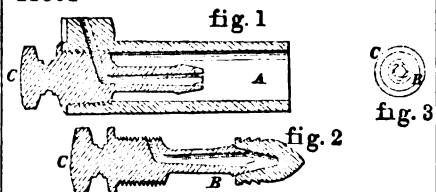
20503



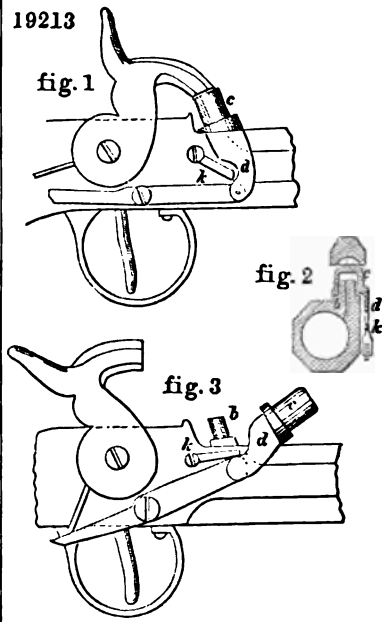
21523



21802



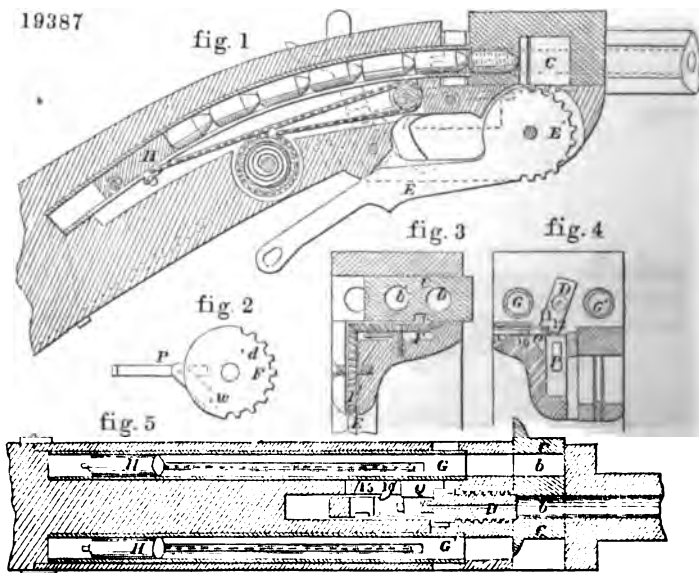
19213

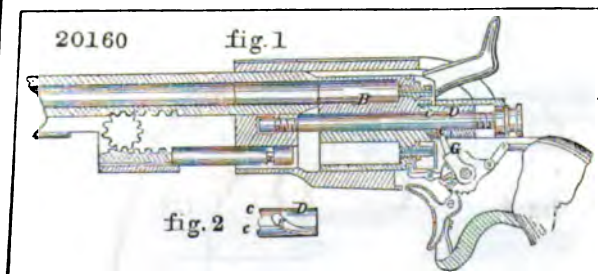
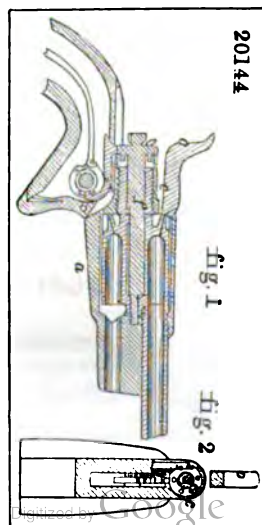
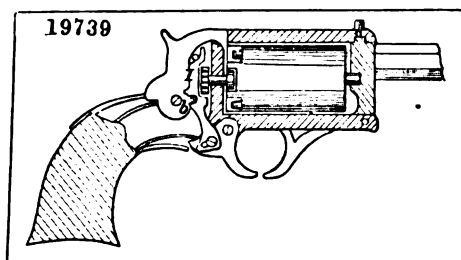
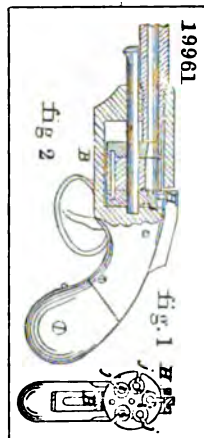
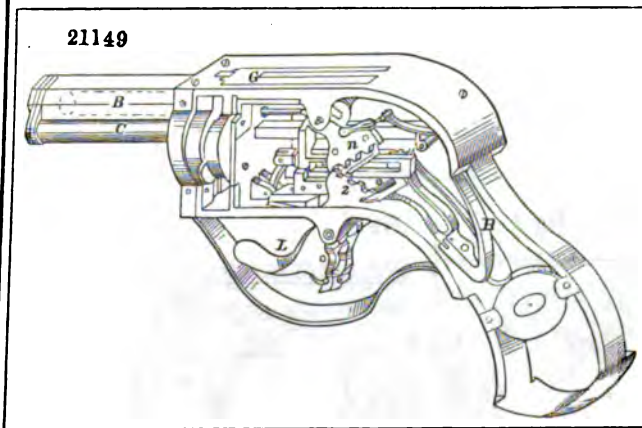
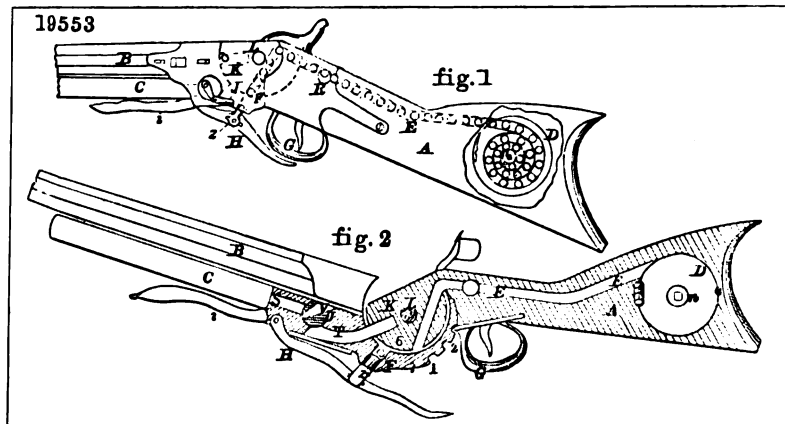


20129



19387





20496

fig. 1

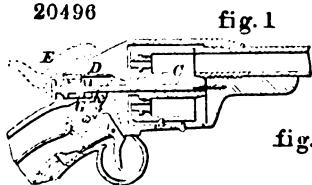
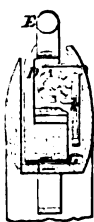


fig. 2



20607

fig. 1

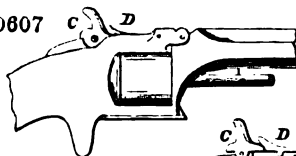
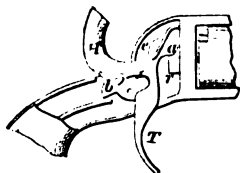


fig. 2



20765



21215



21188

fig. 1

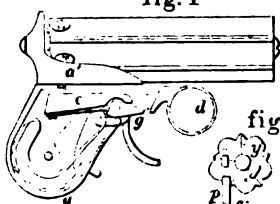


fig. 2

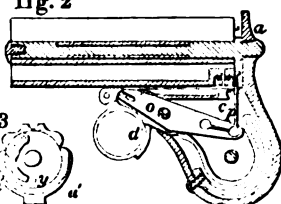


fig. 3



fig. 4



21400

fig. 1



fig. 2



21054

fig. 1

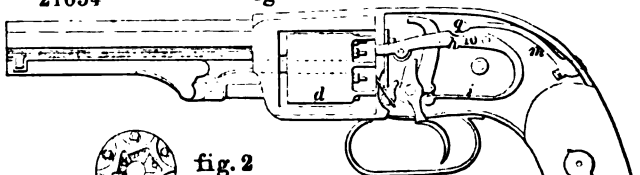


fig. 2



21478

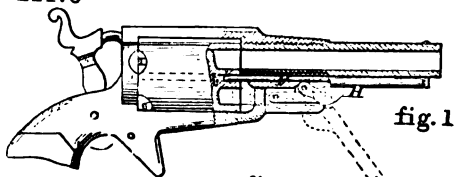
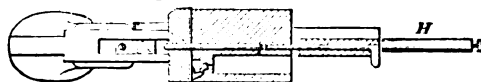
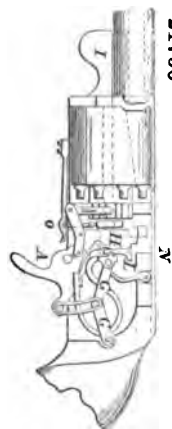


fig. 1

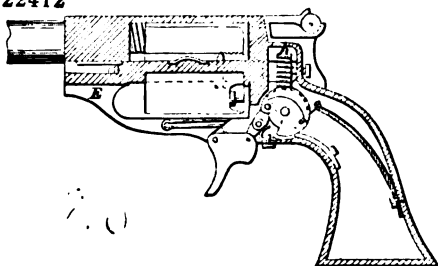
fig. 2



21730



22412



22005

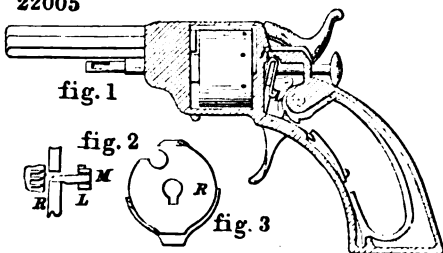


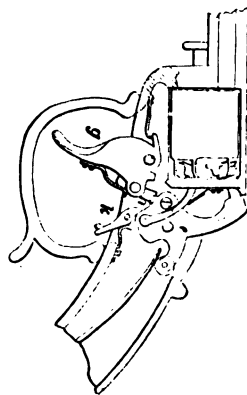
fig. 1

fig. 2

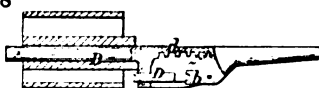


fig. 3

21623



19868



19328

fig. 1

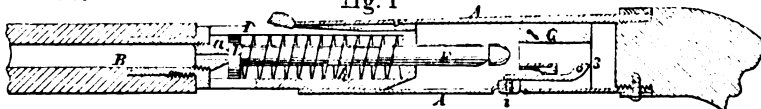


fig. 2



20597

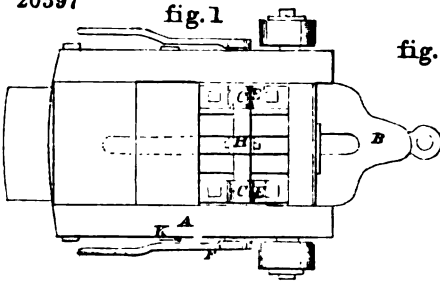
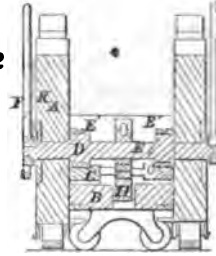


fig.2



20757

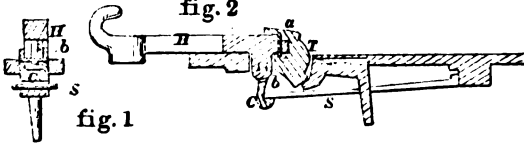
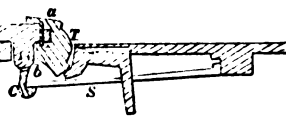


fig.2



21109

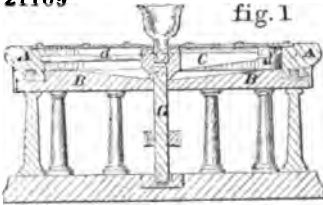
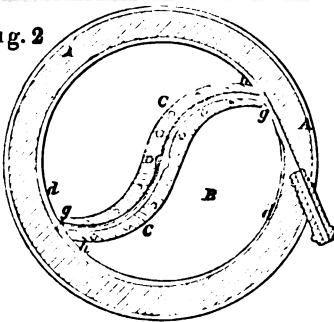


fig.2



19121

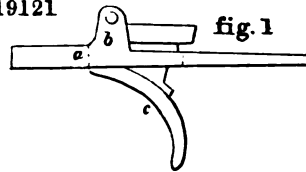
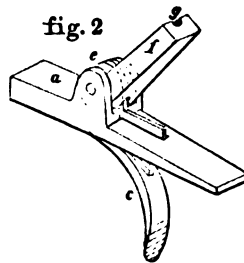


fig.2



22377

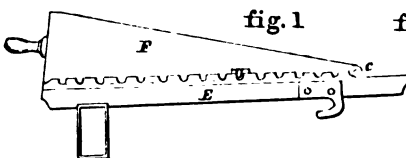
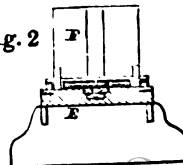
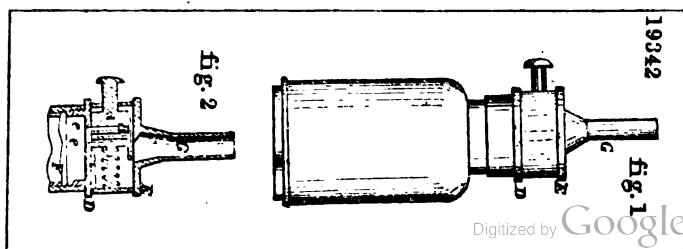
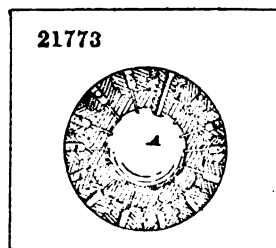
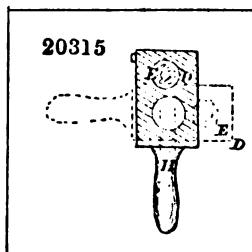
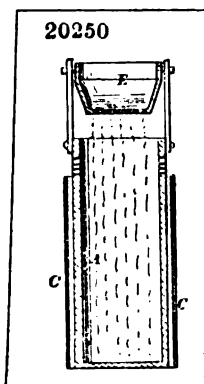
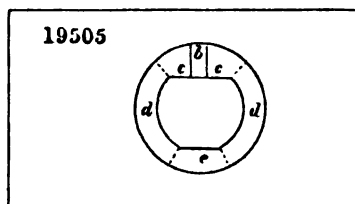
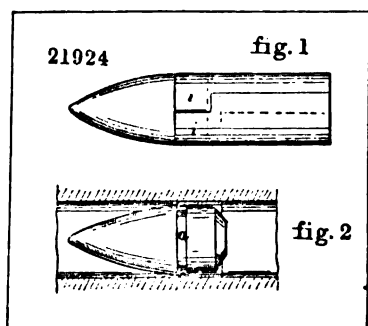
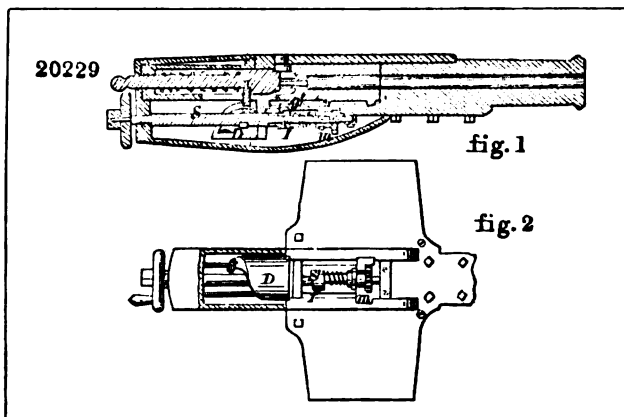


fig.2



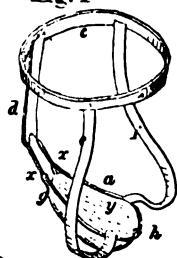




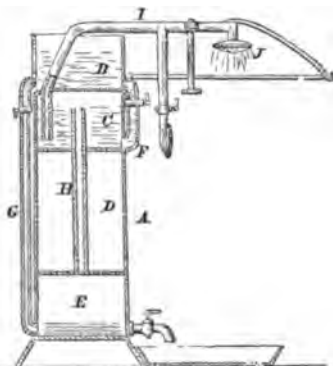


22293

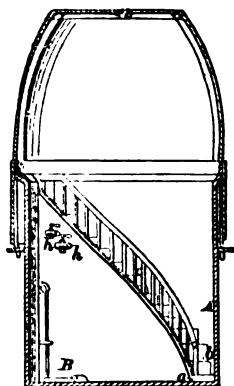
**fig. 1**



22298



**21138**

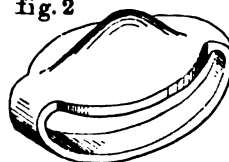


**21790**

**fig. 1**



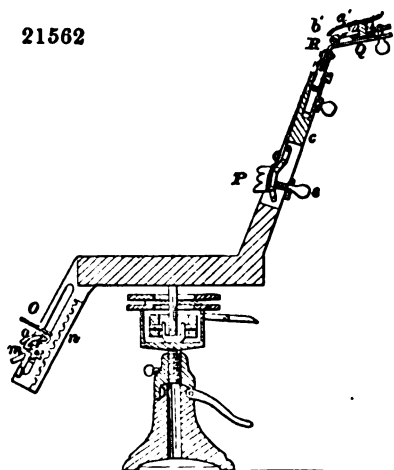
**fig. 2**



22080



**21562**



19858

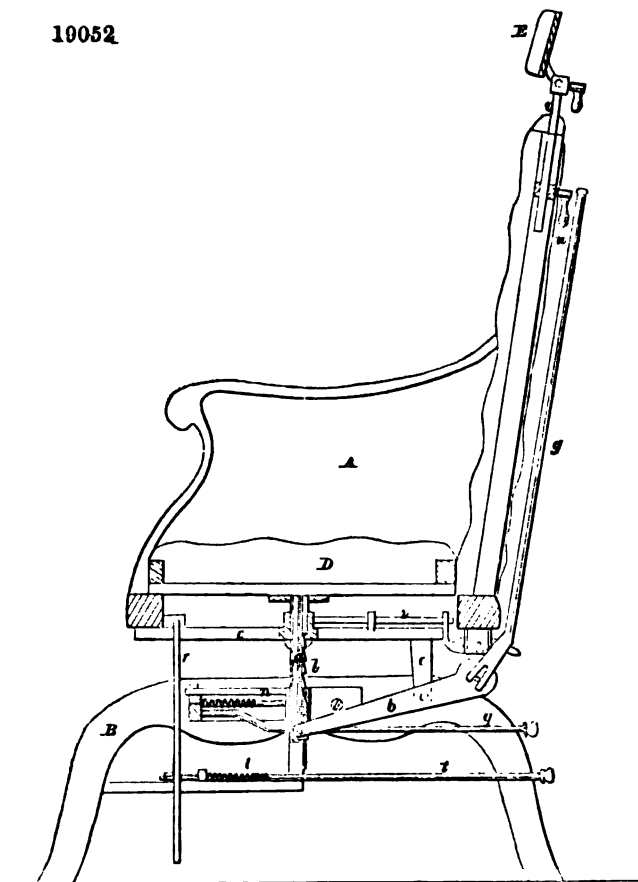
**fig. 1**



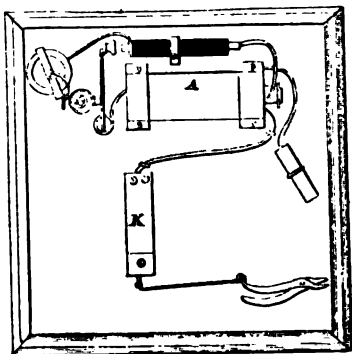
**fig. 2**



19052



22063



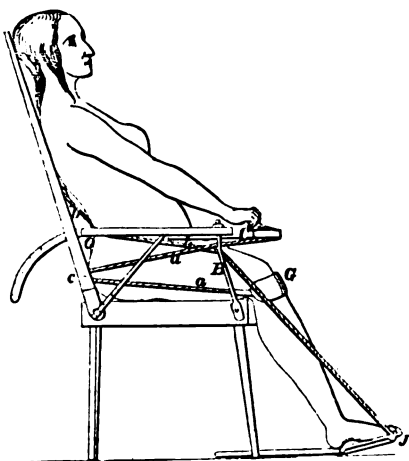
22018



21289



21291



20896

fig. 1

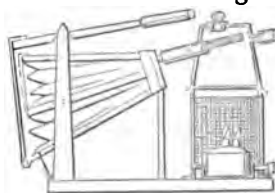


fig. 2

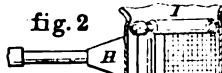
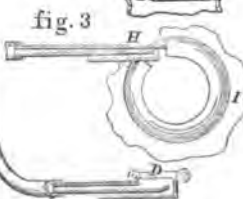


fig. 3



21189

fig. 1



fig. 2

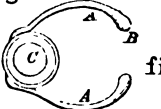
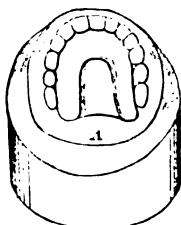


fig. 3



20754



21872

fig. 1

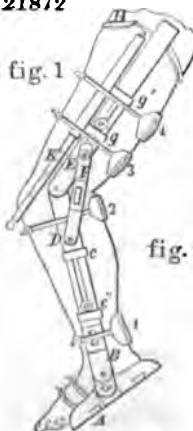
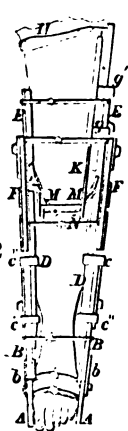


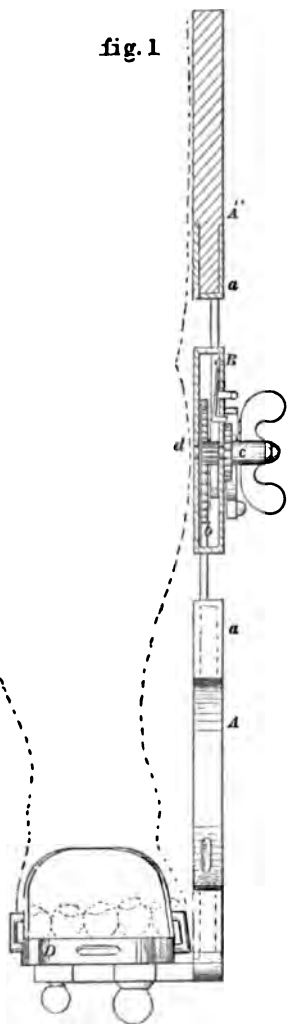
fig. 2



19025

fig. 1

fig. 2



20905

fig. 1

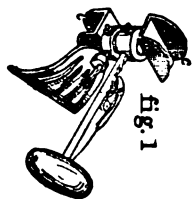
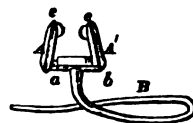


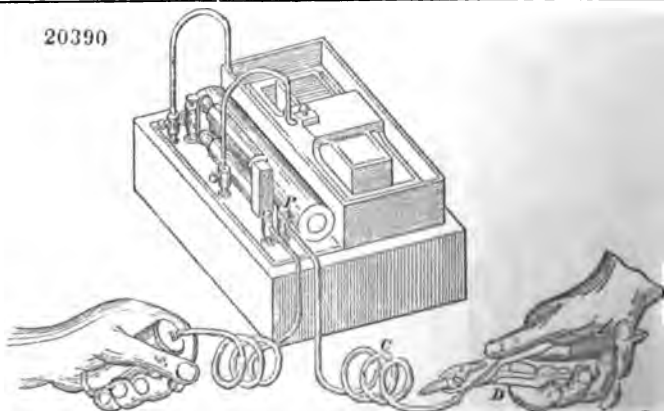
fig. 2



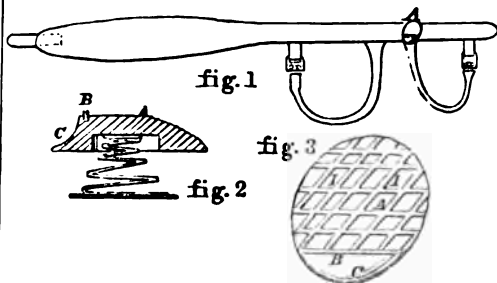
21853



20390



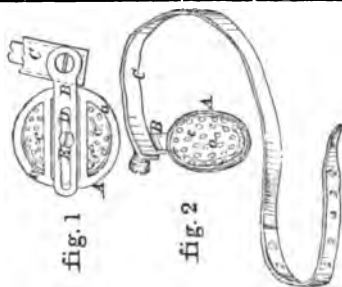
20444



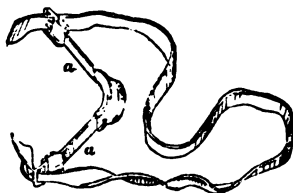
21767



19914

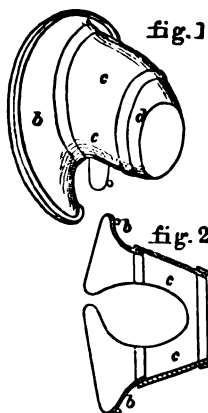


21548

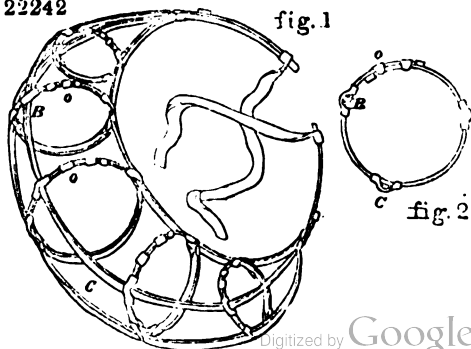


XXI.—WEARING APPAREL, ETC.

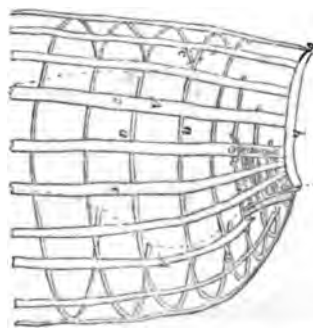
19932



22242



20865

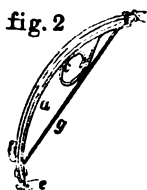


22133

fig. 1



fig. 2

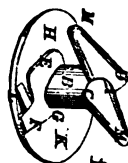


20707

fig. 1



fig. 2



20632

fig. 1

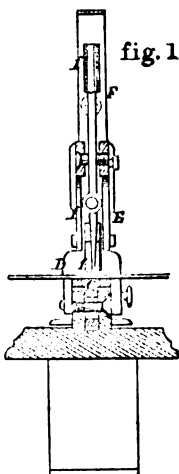


fig. 2

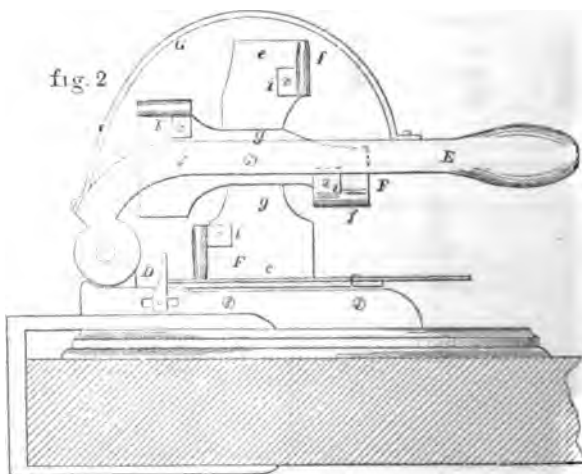
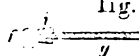


fig. 3



20194

fig. 1

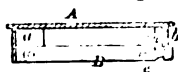
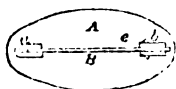


fig. 2



22443

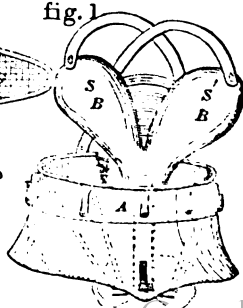
fig. 1



fig. 2



fig. 3



19120

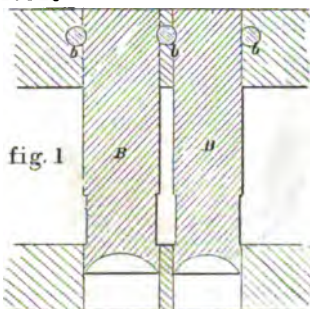


fig. 1

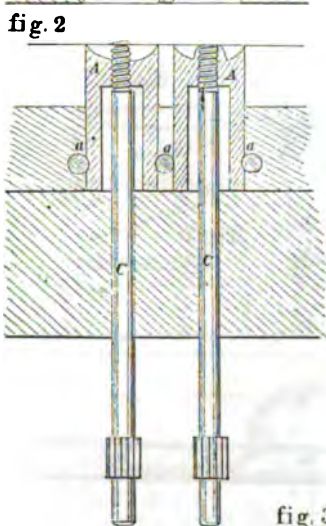


fig. 2

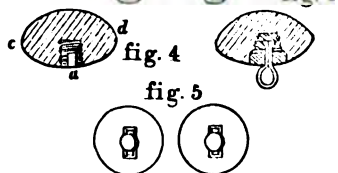


fig. 3

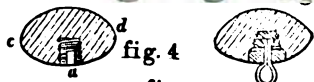


fig. 4

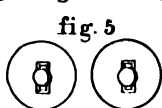


fig. 5

19418

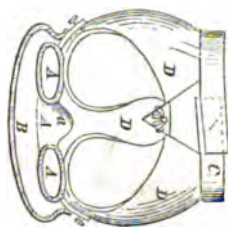


fig. 1

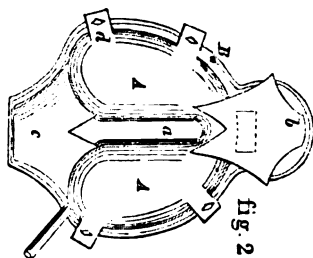
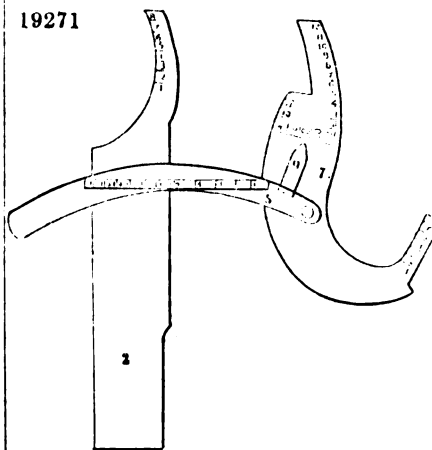


fig. 2

19271



19223

fig. 2

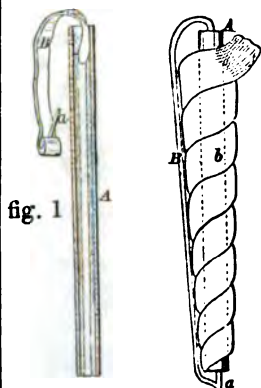
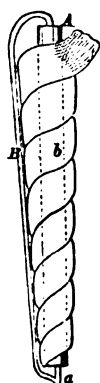


fig. 1

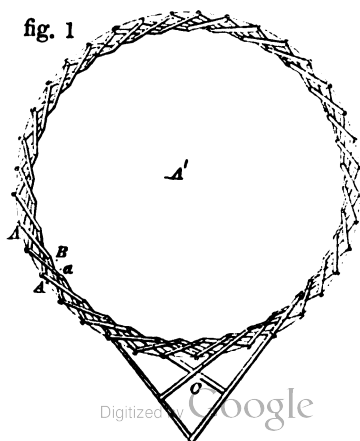


22366

fig. 1

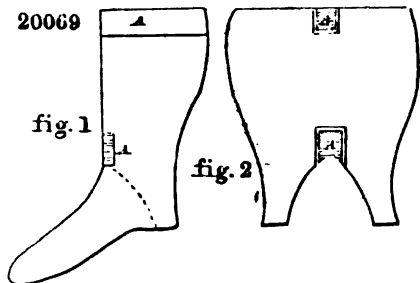


fig. 2

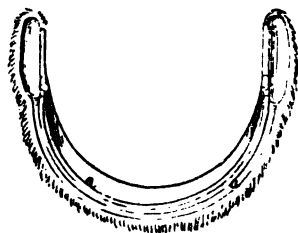




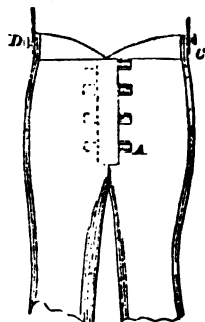
20069



20834



20708



21966

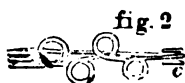
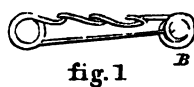
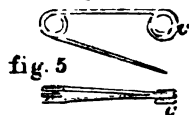
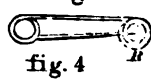
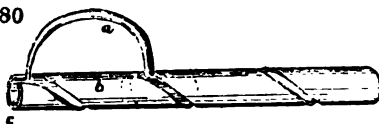


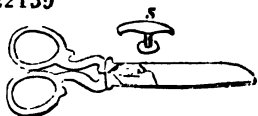
fig. 3



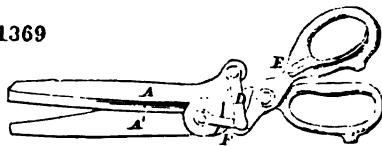
19280



22159



21369



22039

fig. 1

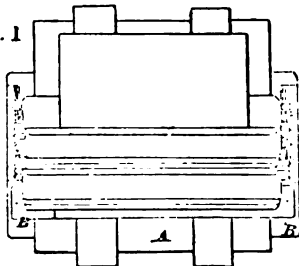


fig. 2



22442

fig. 1

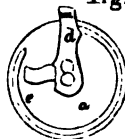


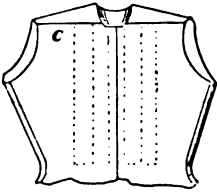
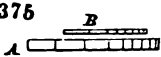
fig. 2



fig. 3



22376



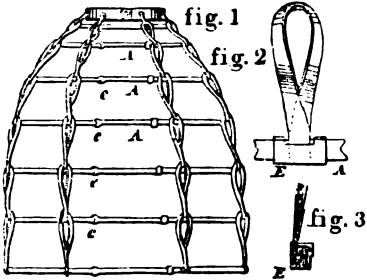
20801



21839



20561



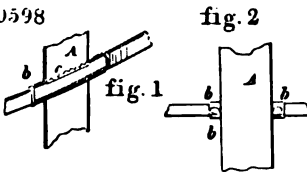
22385



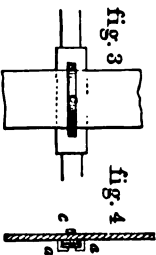
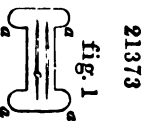
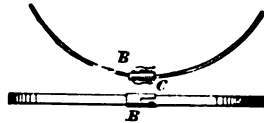
20720



20598



21747



20681

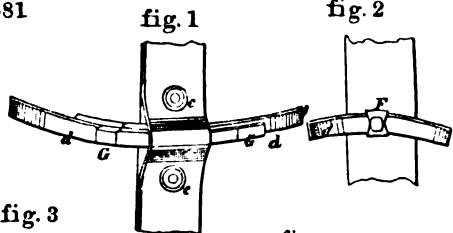


fig. 3



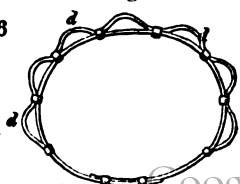
fig. 5

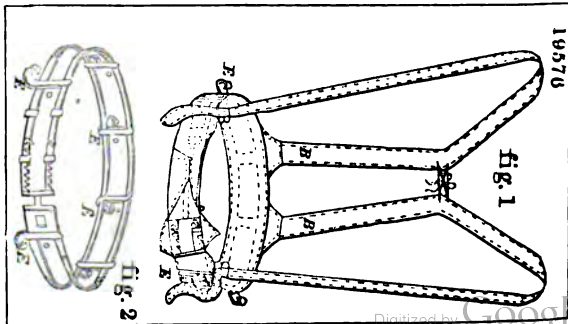
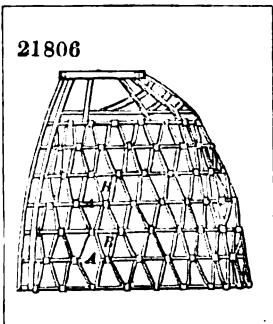
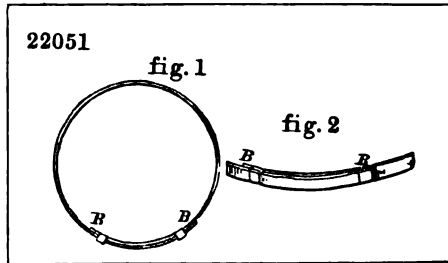
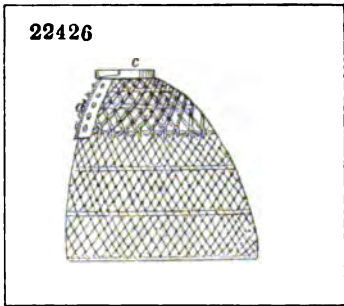
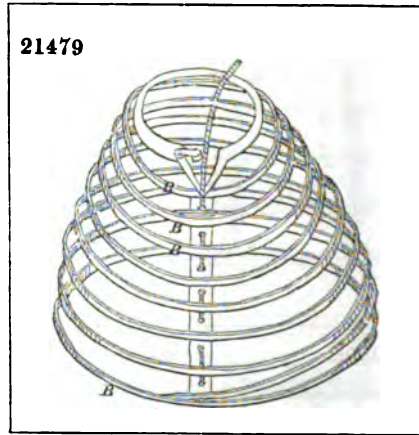
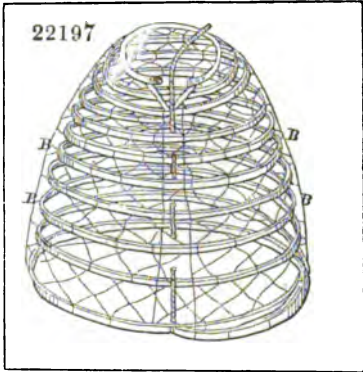
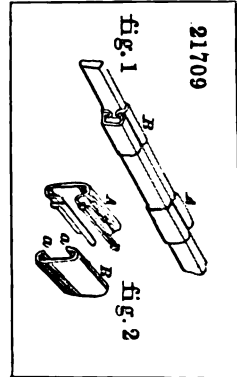
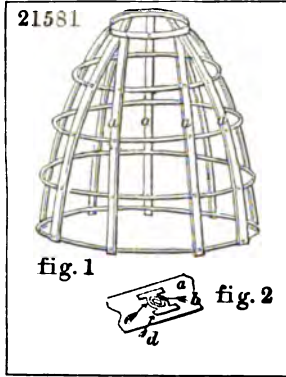
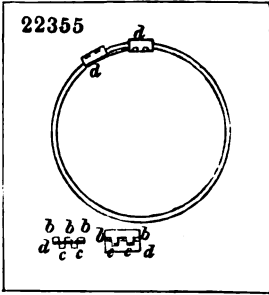


fig. 6

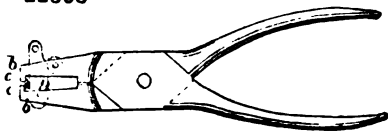


fig. 4

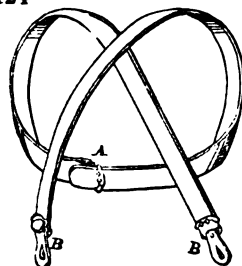




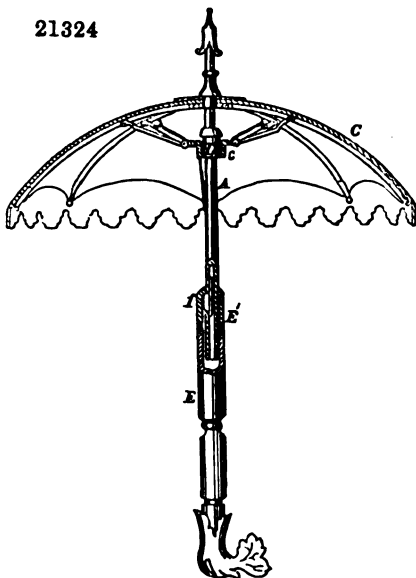
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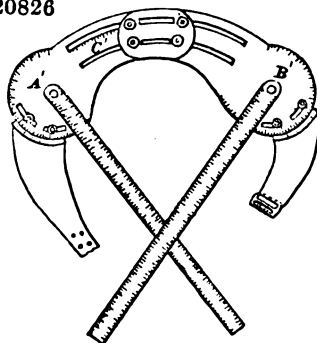
20424



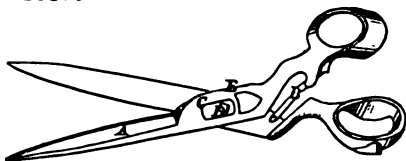
21324



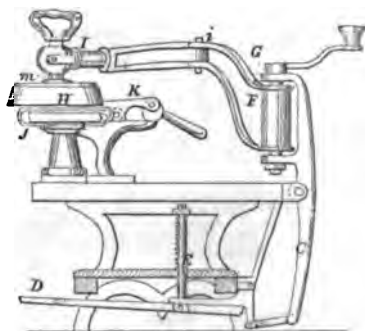
20826



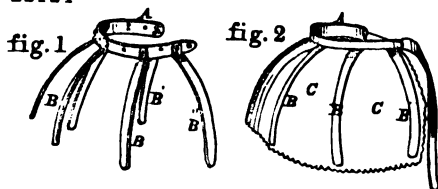
20879



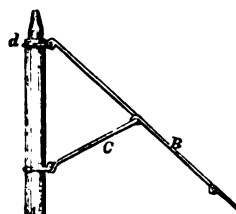
20519

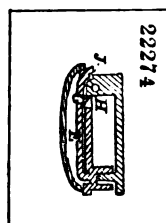
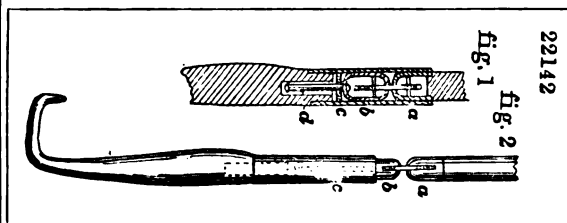
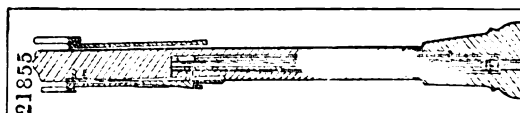
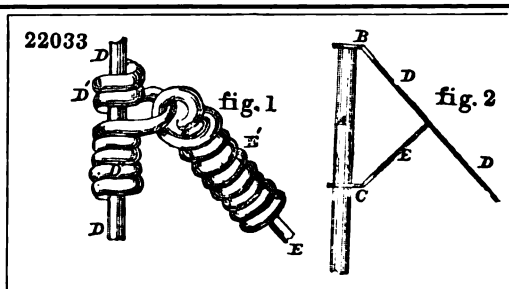
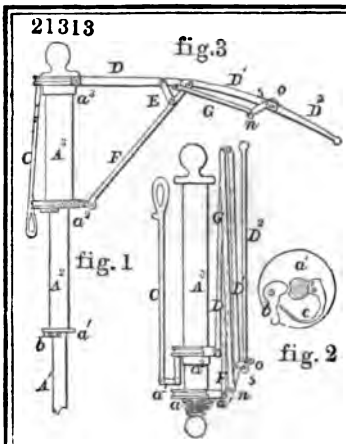


22124

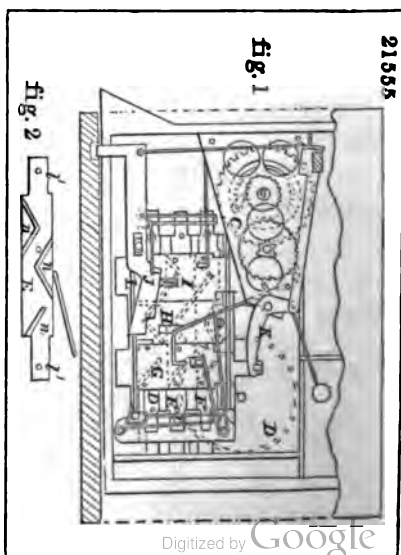
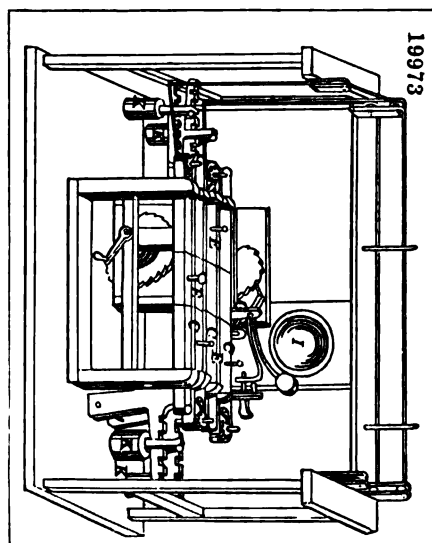
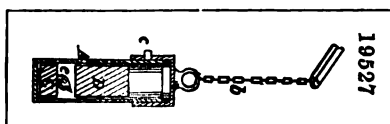


19998





## XXII.—MISCELLANEOUS.



21849

fig. 1

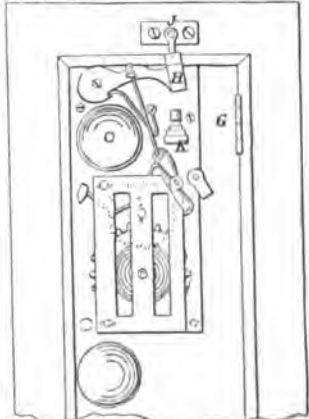
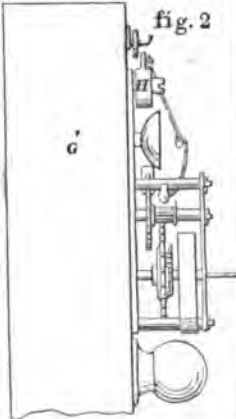


fig. 2



20810

fig. 2

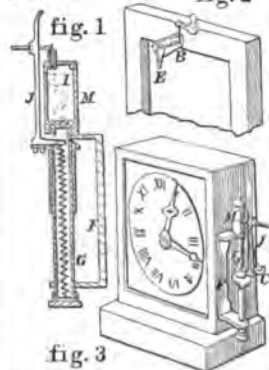
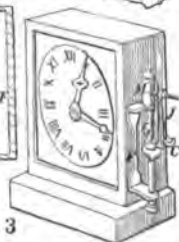
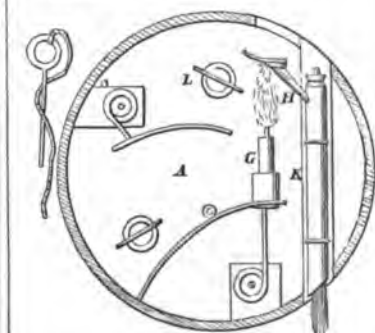


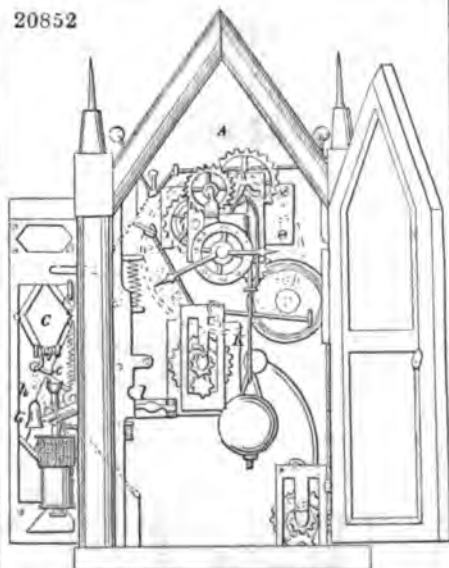
fig. 3



22024



20852



19926

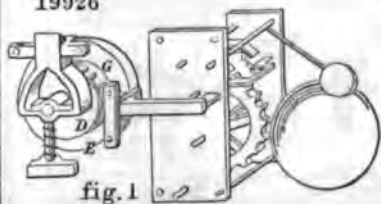


fig. 1

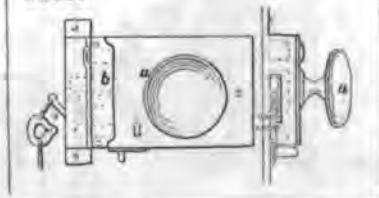
fig. 3

fig. 2

fig. 4



21457



21336

fig. 1

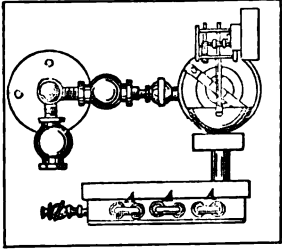
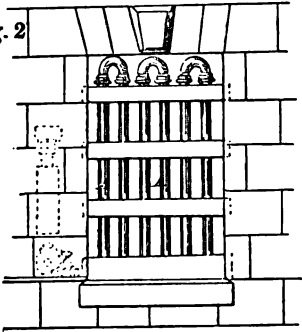


fig. 2



19295

fig. 1

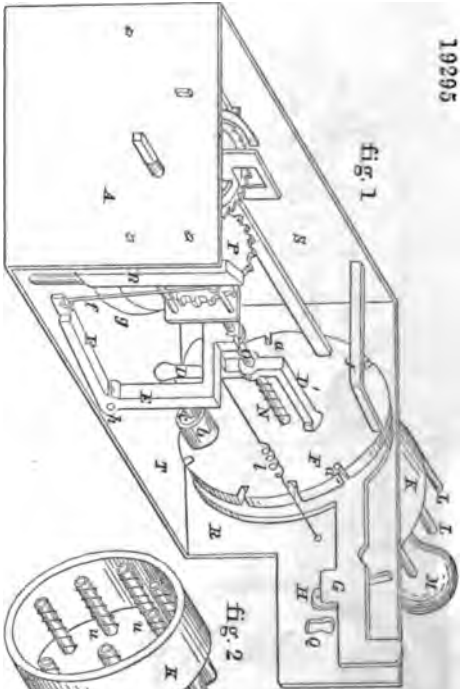
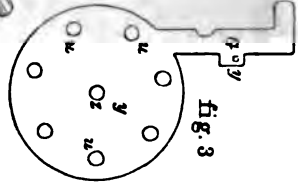


fig. 2



fig. 3



20333

fig. 1

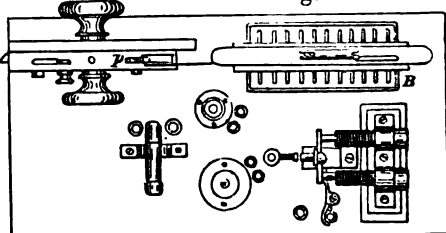
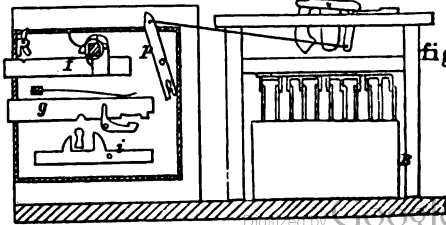
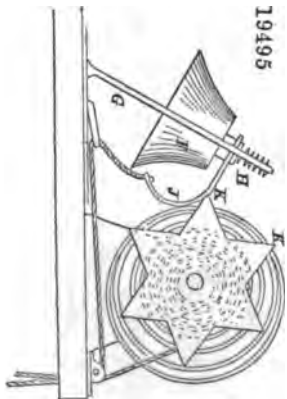


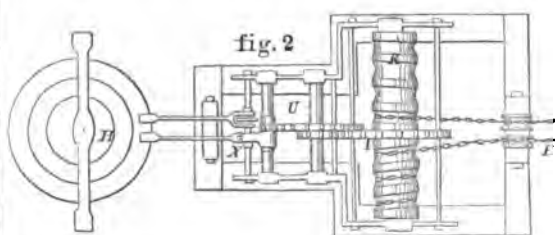
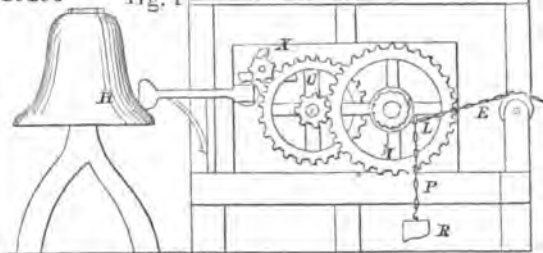
fig. 2



19495



19196 fig. 1



21719

fig. 1

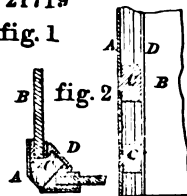
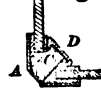


fig. 2



20085

fig. 1

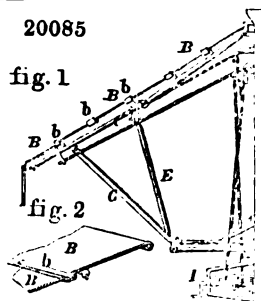


fig. 2



22176

fig. 1

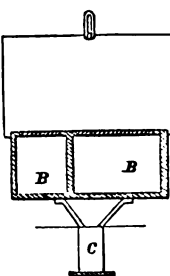


fig. 2

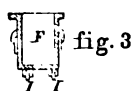
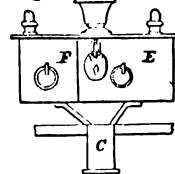
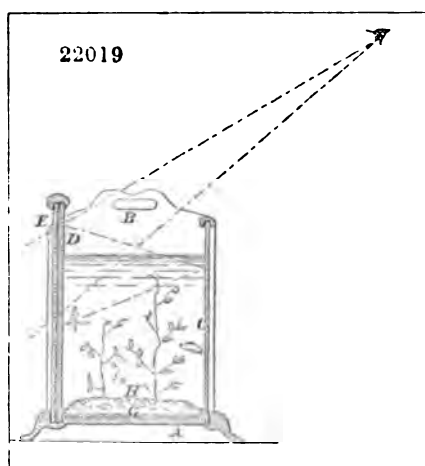


fig. 3

22019



20256

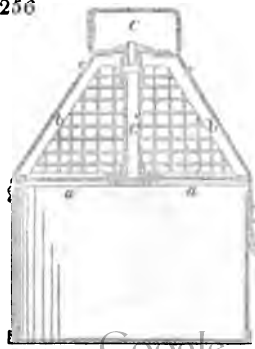


fig. 1

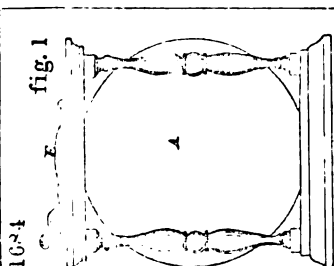


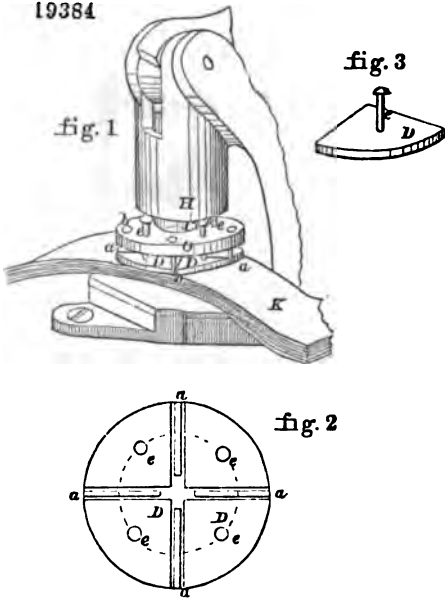
fig. 2



21024

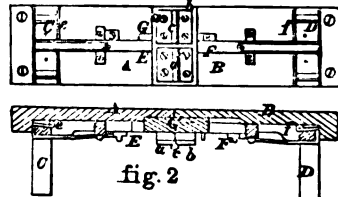


19384



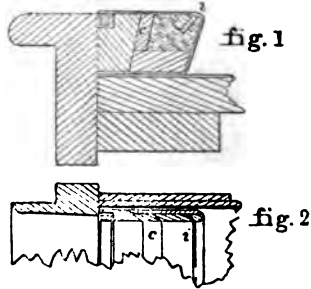
22371

fig. 1

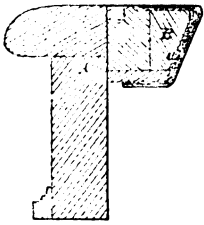


21159

fig. 1

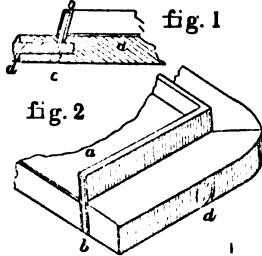


22263

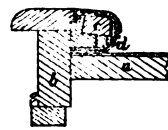


22064

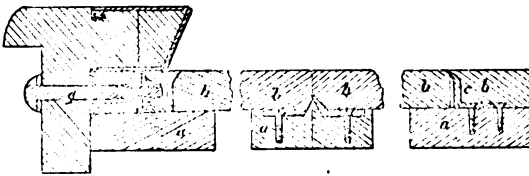
fig. 1



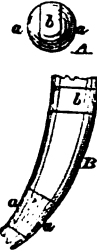
20156



22001



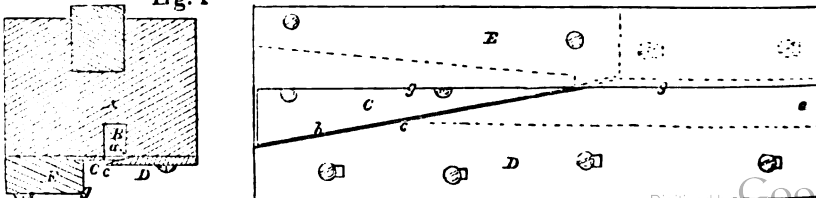
21444



19229

fig. 1

fig. 2



19074

fig. 1

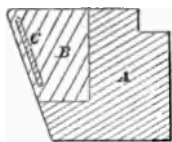


fig. 3

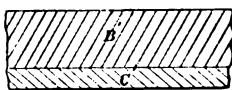


fig. 2

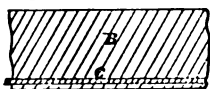
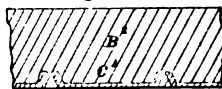
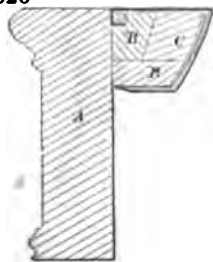


fig. 4



22020



19101

fig. 1

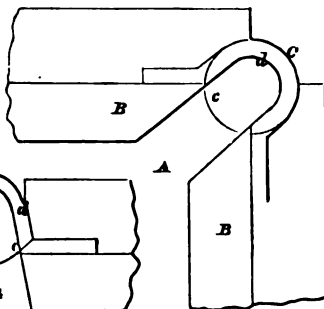
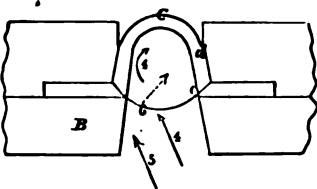


fig. 2



20548

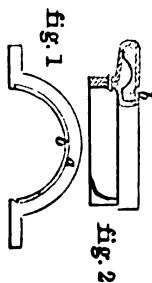


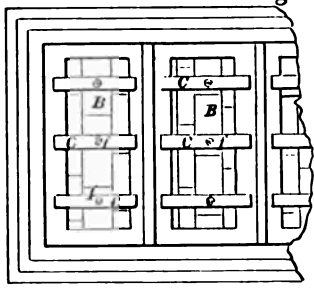
fig. 2

19546

fig. 1



fig. 2



22186



22370

fig. 1

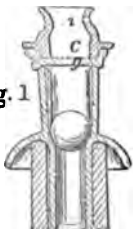


fig. 2



19323

fig. 2

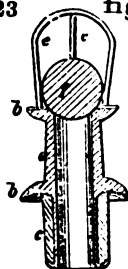
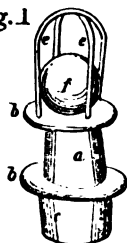
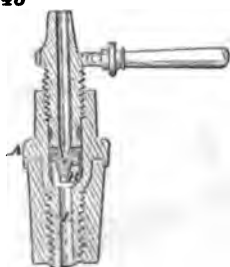
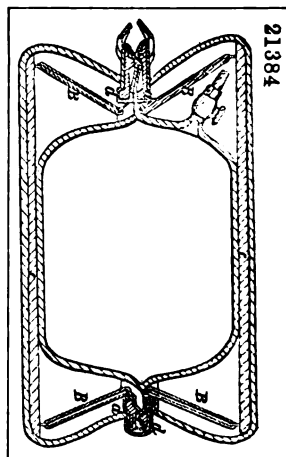
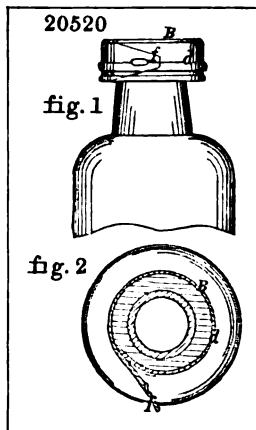
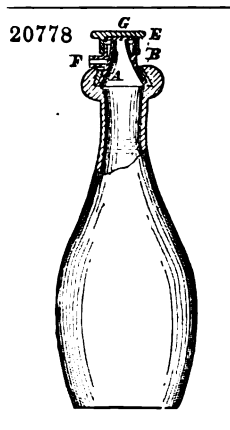


fig. 1

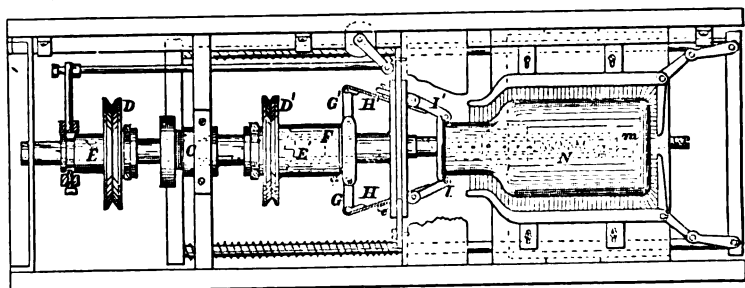


20843

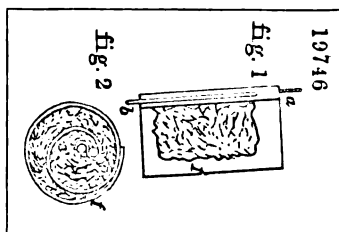
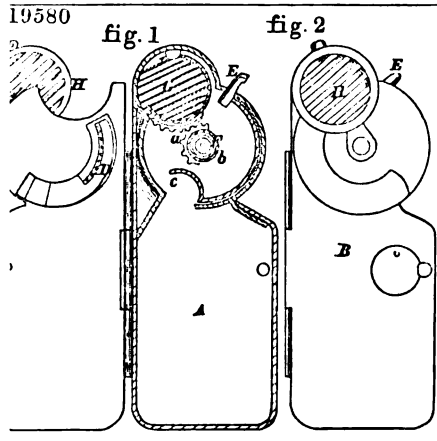




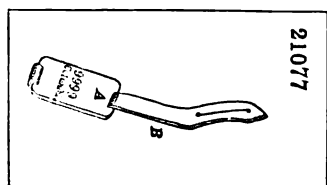
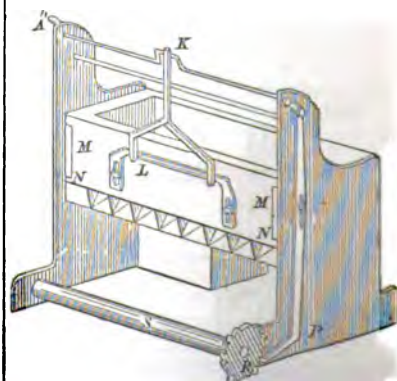
20113



19580



20240



19341

fig. 1

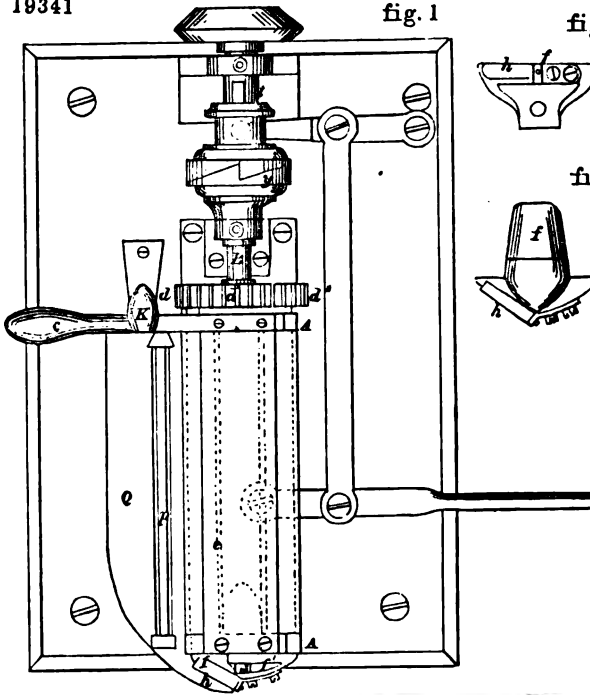


fig. 3

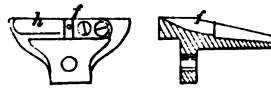


fig. 4

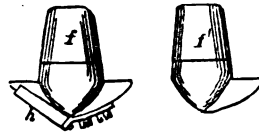


fig. 5

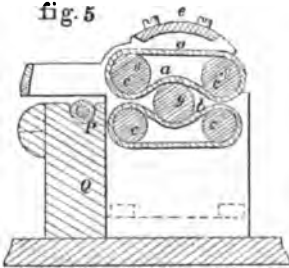
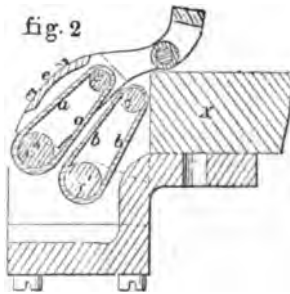


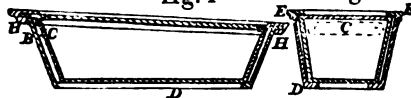
fig. 2



20095

fig. 1

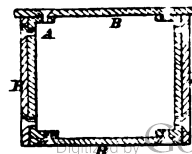
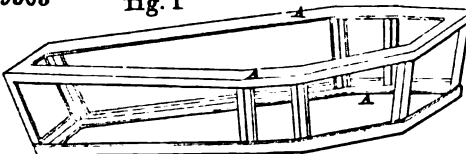
fig. 2



19508

fig. 1

fig. 2



20771

fig. 1

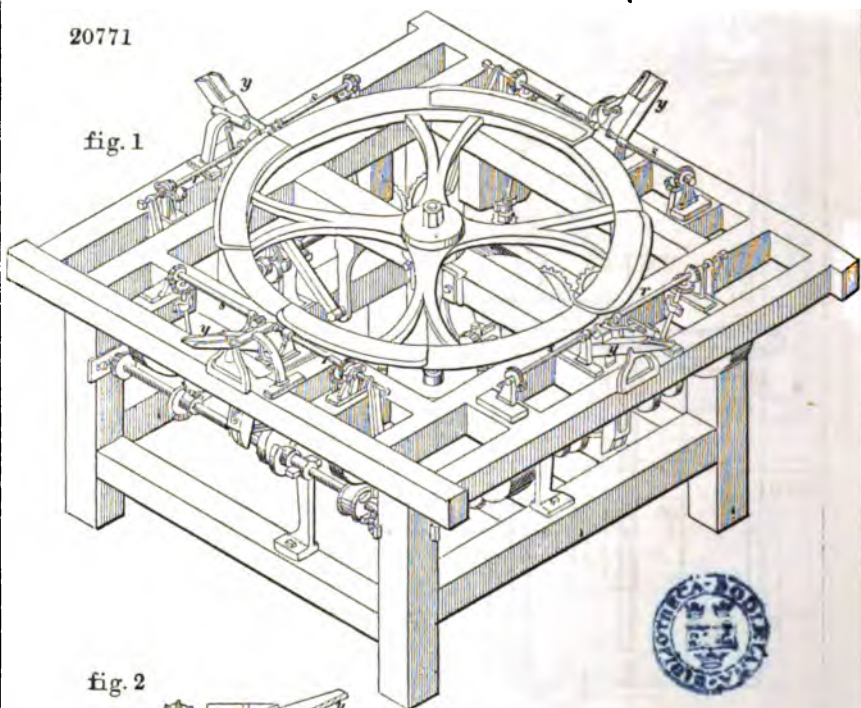
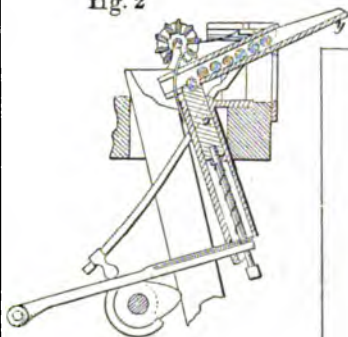
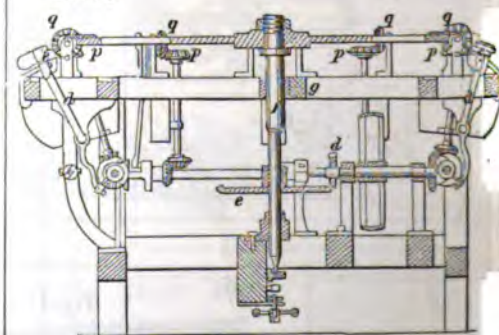


fig. 2



20770



19109

fig. 1

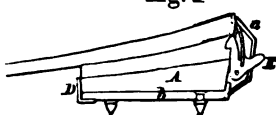


fig. 2

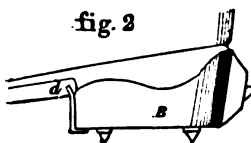
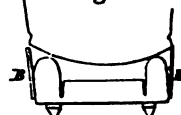


fig. 3



21944

fig. 1

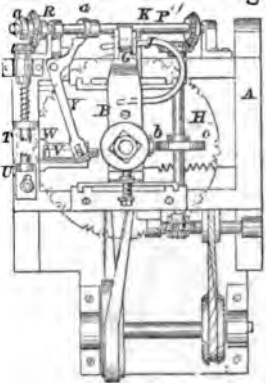


fig. 2

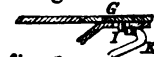
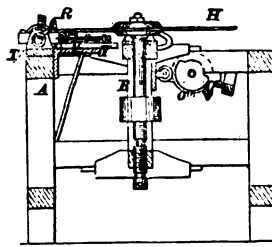


fig. 3



21955

fig. 1

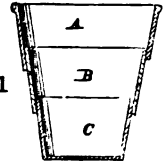
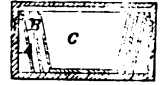
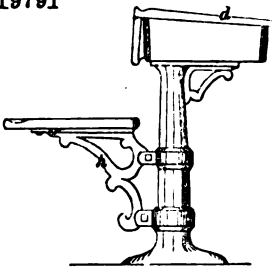


fig. 2



19791



21249

fig. 1

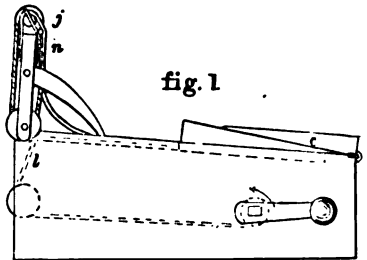
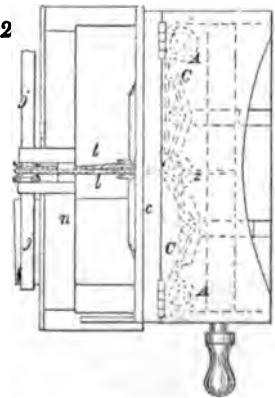
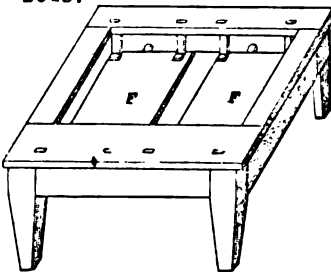


fig. 2



20487



20859

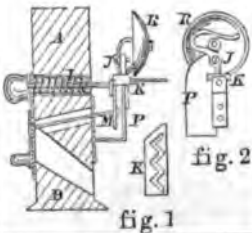
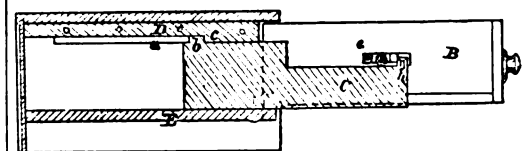


fig. 2

fig. 1

20100



20703

fig. 1

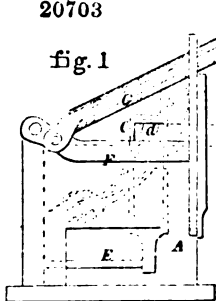
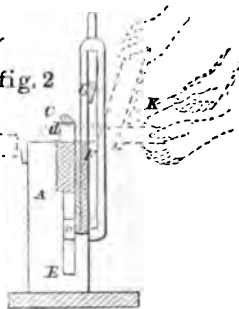
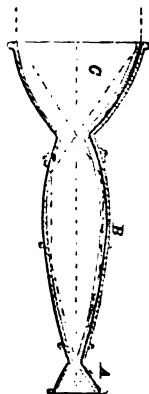


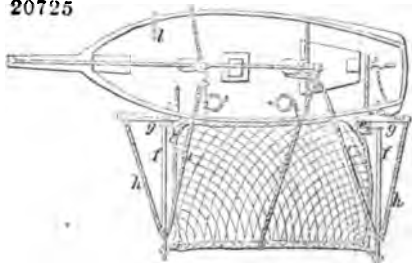
fig. 2



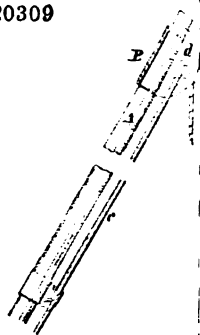
20901



20725



20309



21282

fig. 1

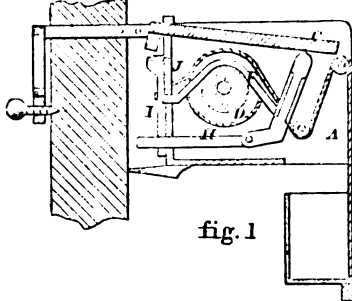
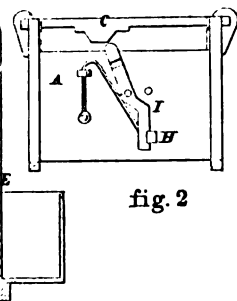
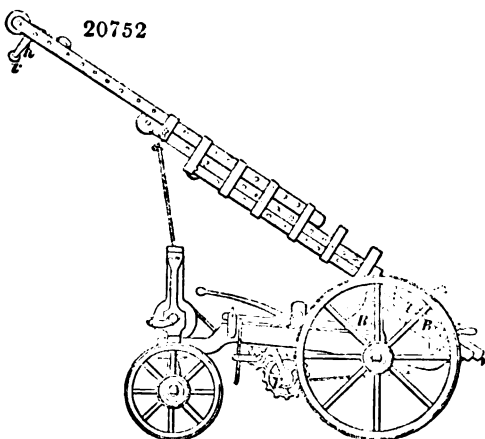


fig. 2



20752



20343

fig. 2

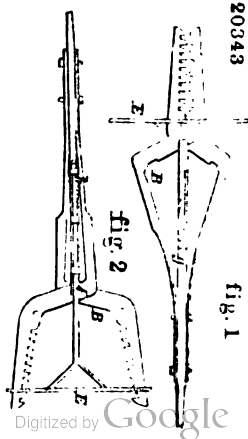
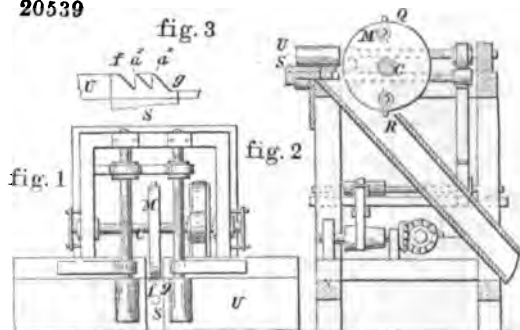
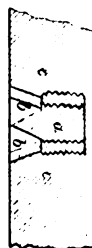


fig. 1

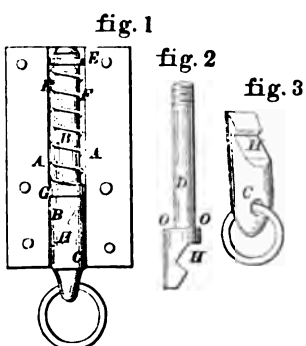
20539



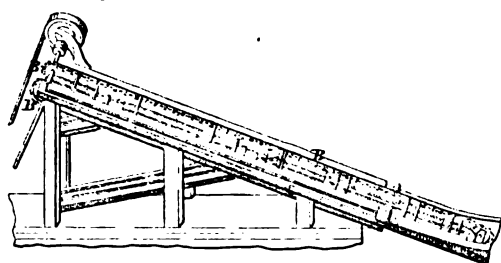
19205



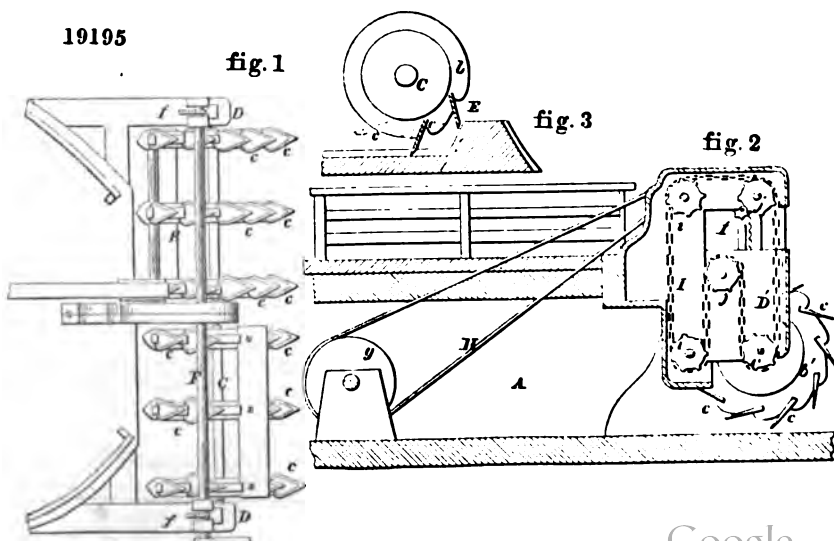
19761



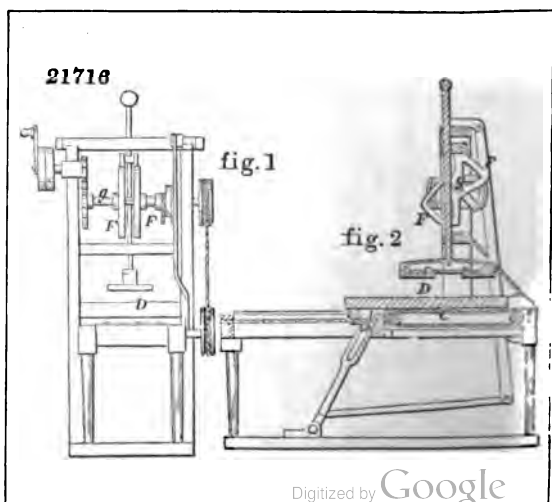
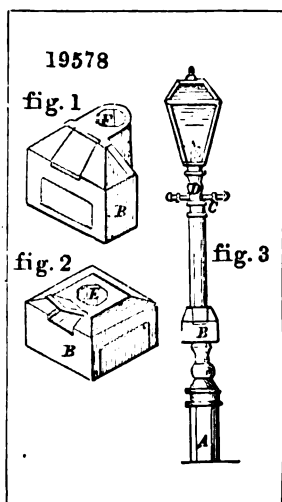
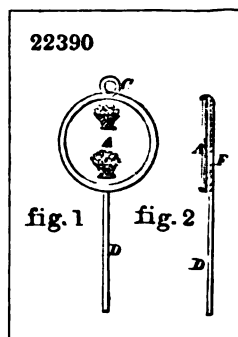
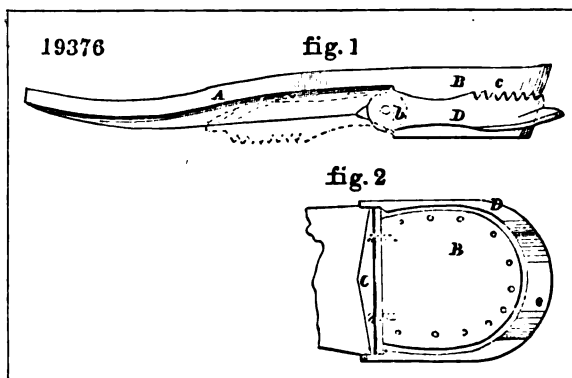
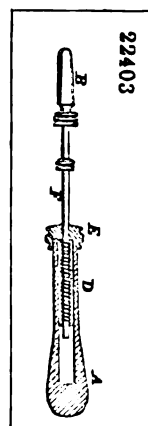
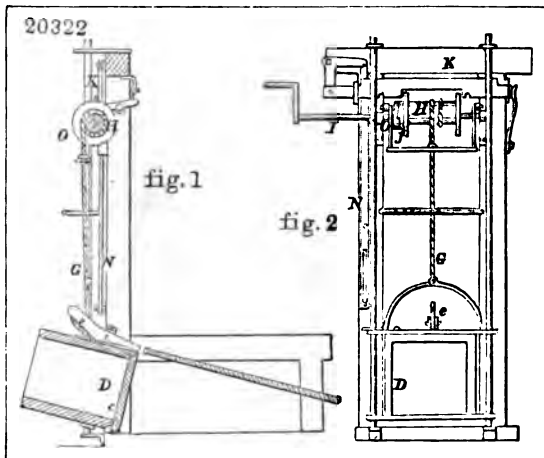
22210



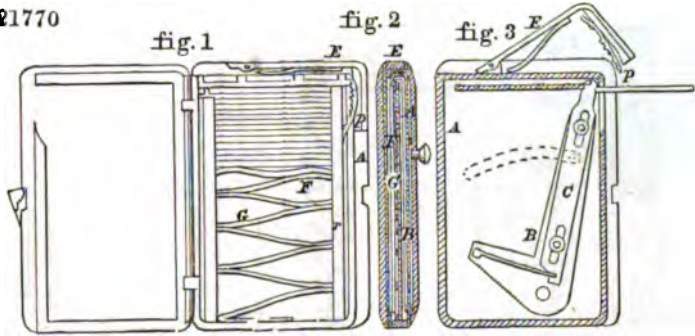
19195



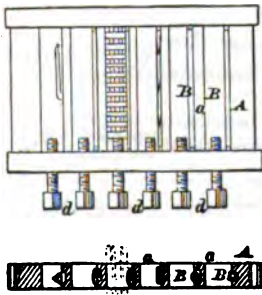




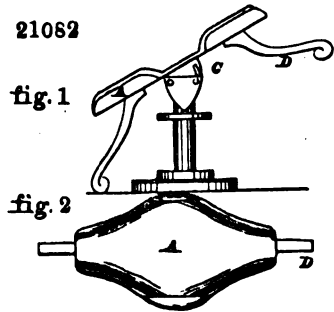
21770



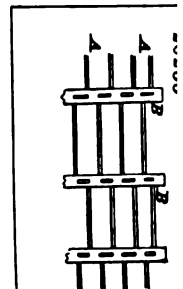
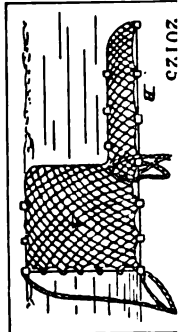
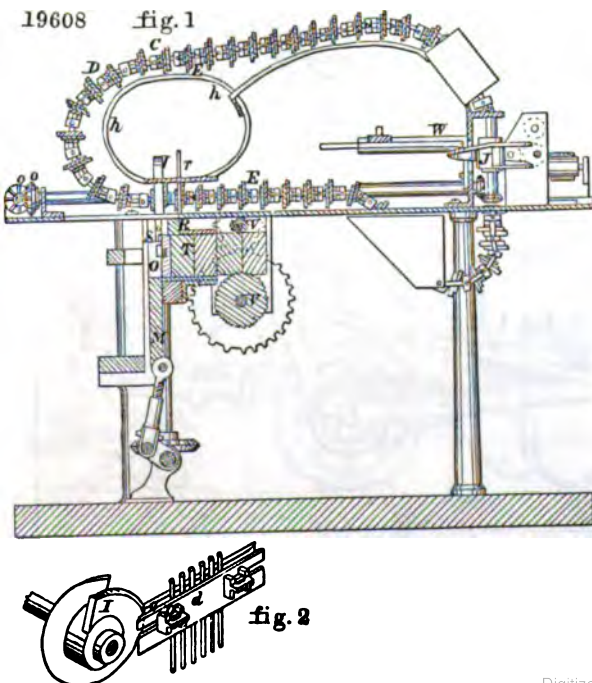
21794



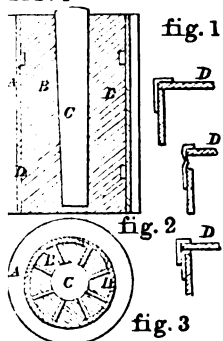
21062



19608



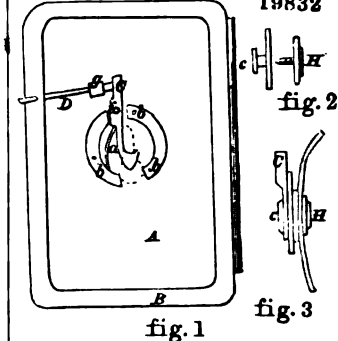
21274



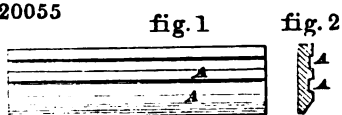
20715



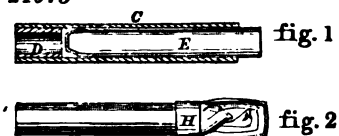
19832



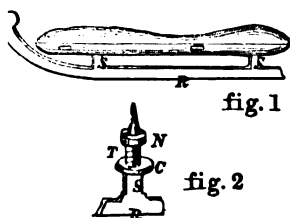
20055



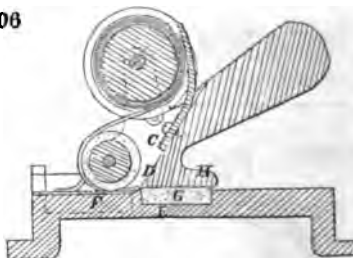
21973



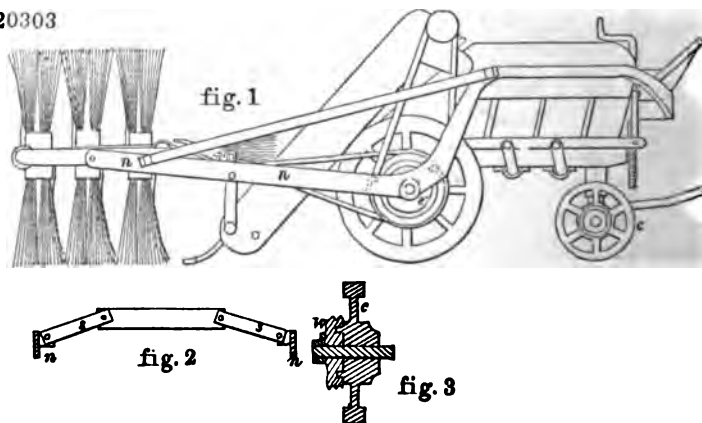
21585



20306



20303



21473

fig. 3

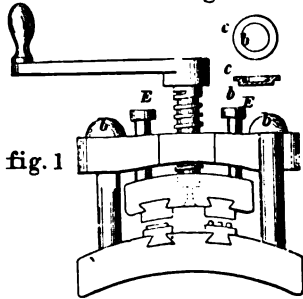
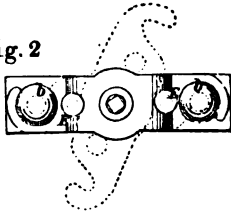


fig. 1

fig. 2



21743

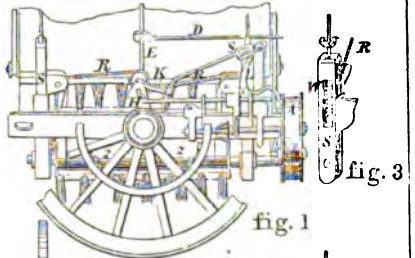


fig. 1

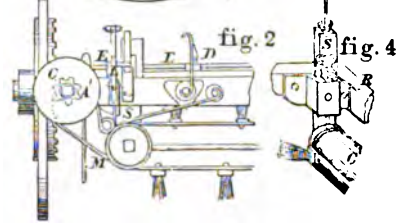


fig. 2

fig. 4

19856

fig. 1

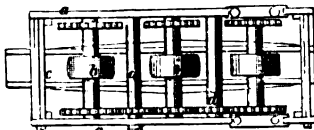
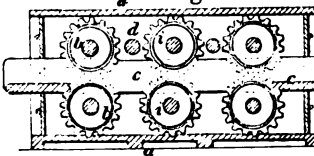


fig. 2



21703

fig. 1

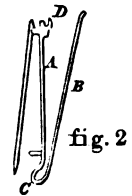
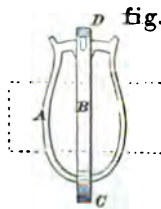


fig. 2

21933

fig. 1

fig. 2



20199



fig. 1

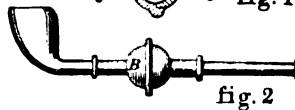
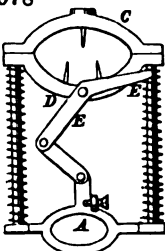


fig. 2

22078



20075

fig. 1

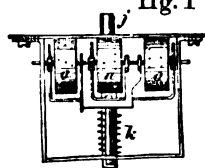
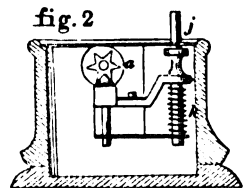
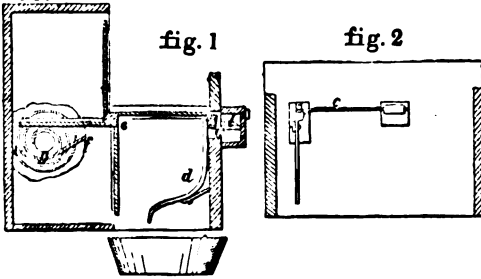


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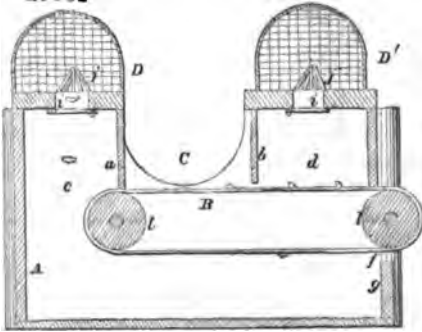
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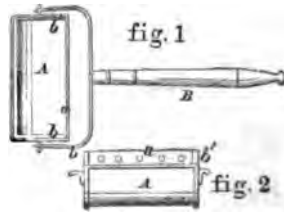
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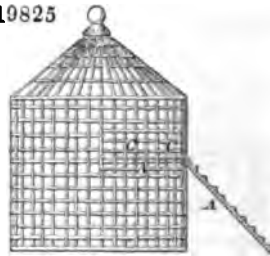
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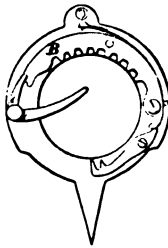
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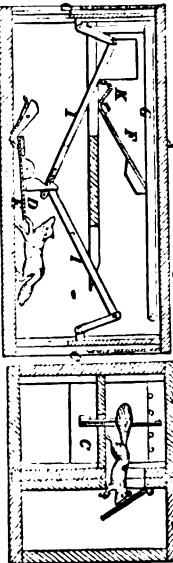
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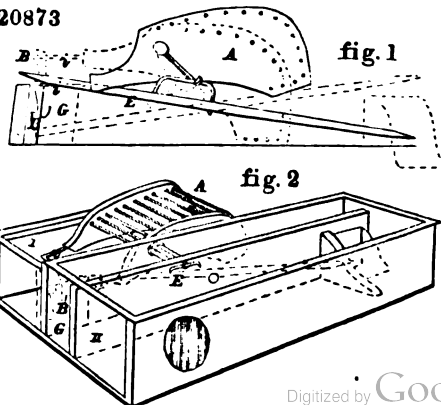
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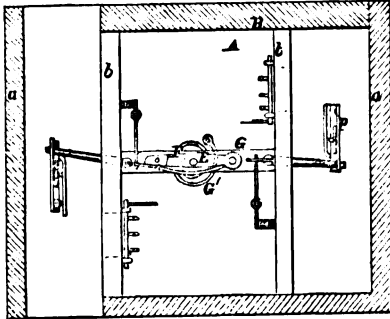
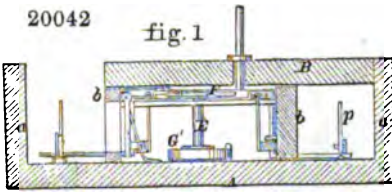


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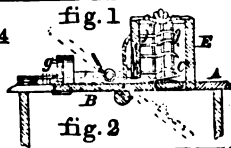
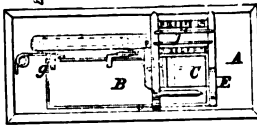


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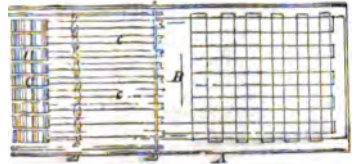


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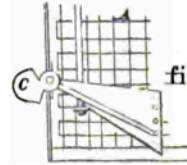
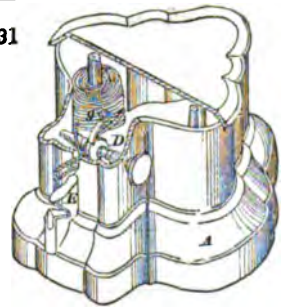


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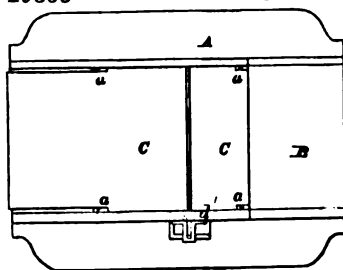


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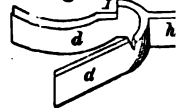
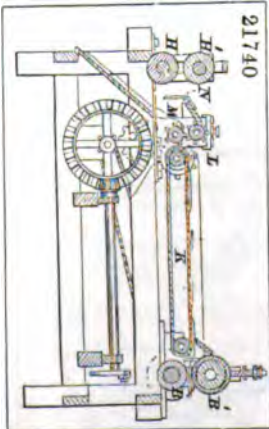
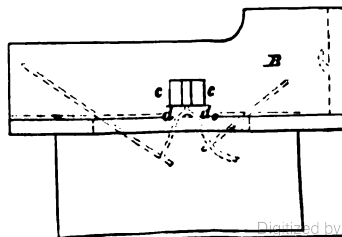


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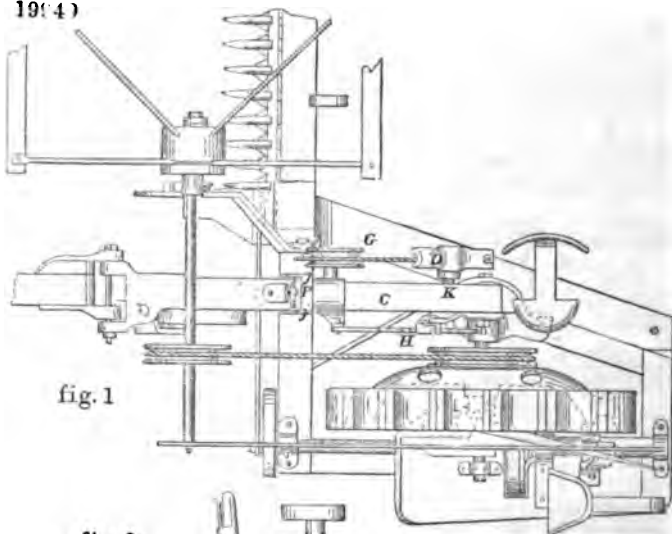
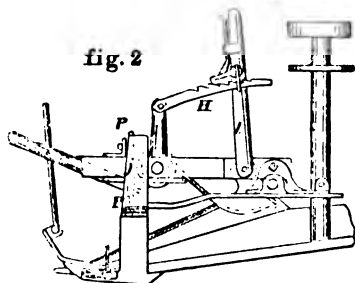


fig. 1

fig. 2



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fig. 1

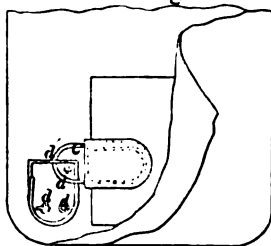
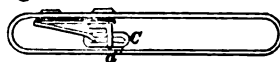


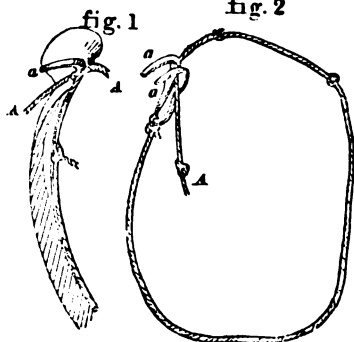
fig. 2



20809

fig. 1

fig. 2



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fig. 1

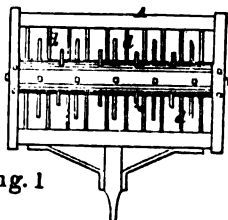
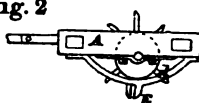
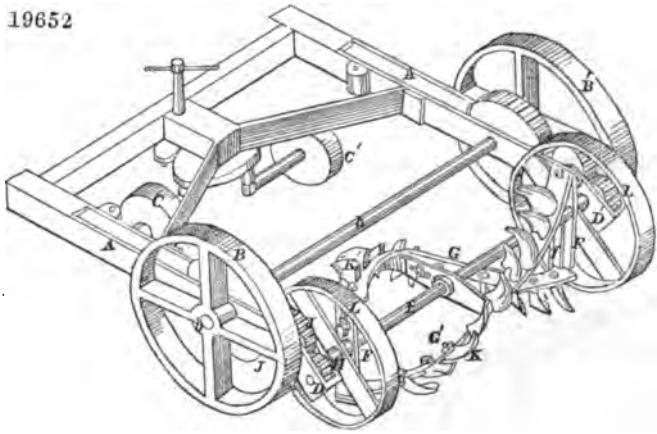


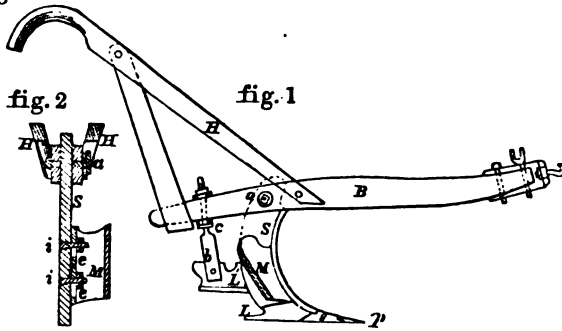
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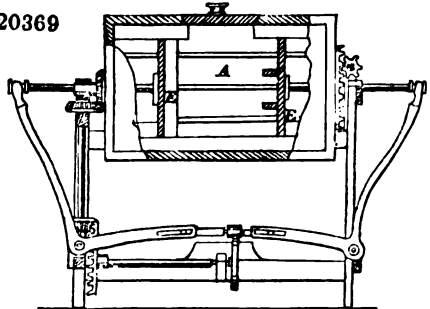
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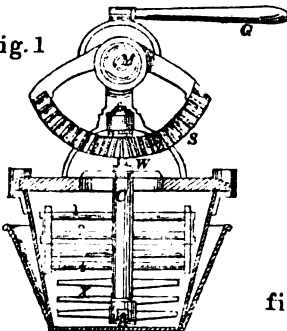
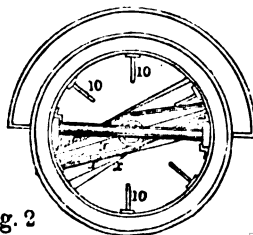
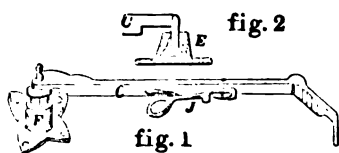


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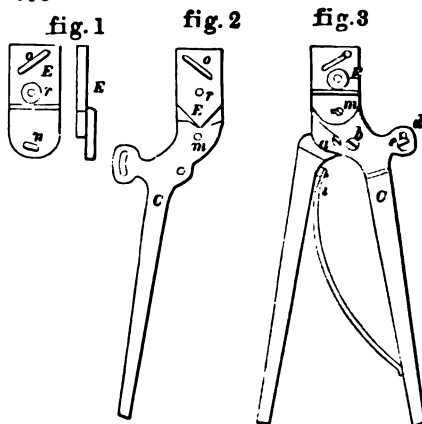




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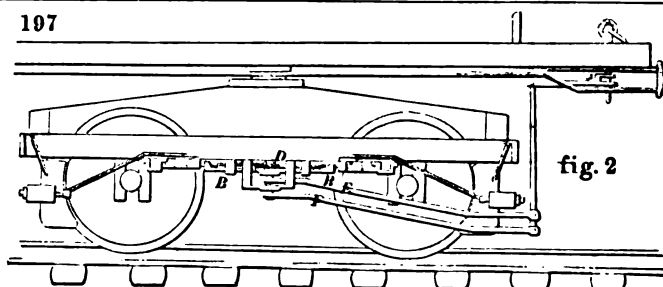


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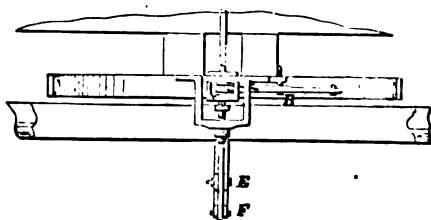
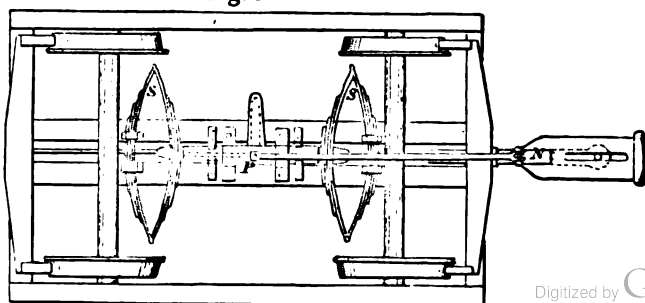
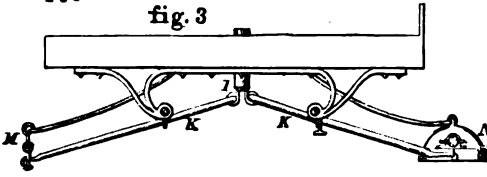


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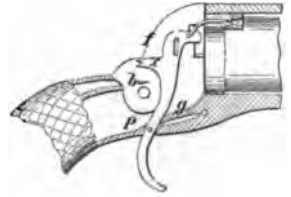


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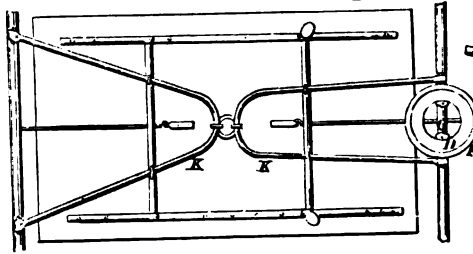


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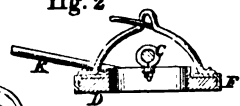
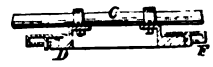


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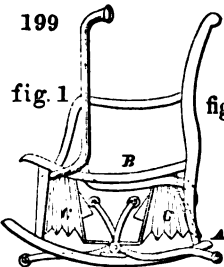
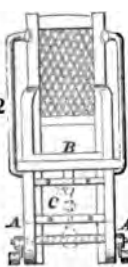
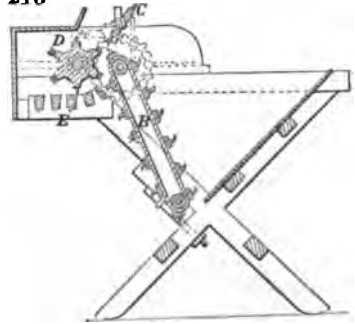


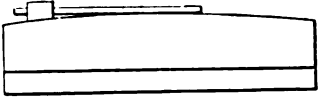
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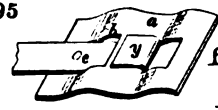
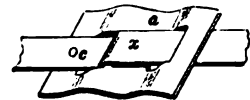
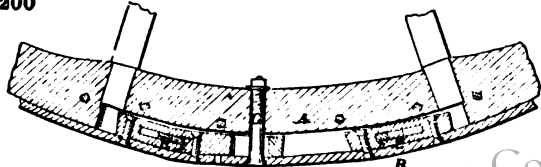


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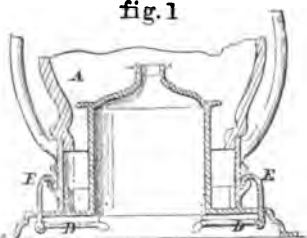
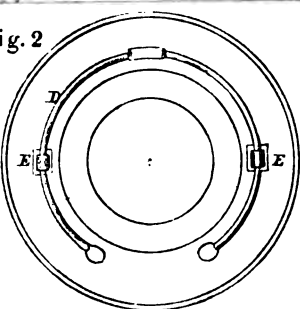


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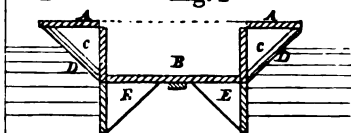


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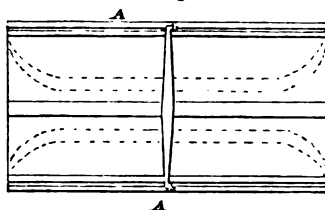
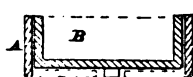


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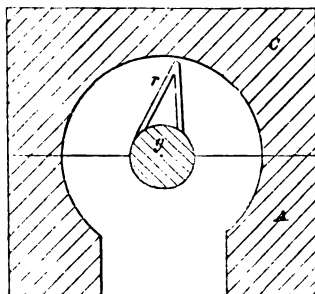
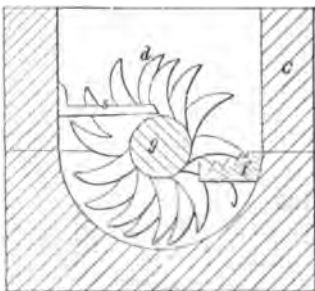
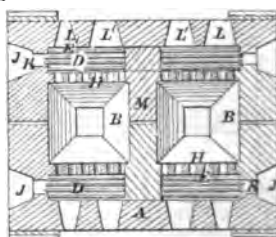


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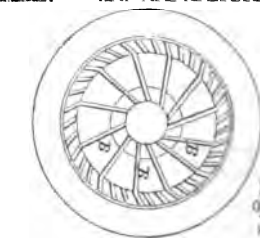
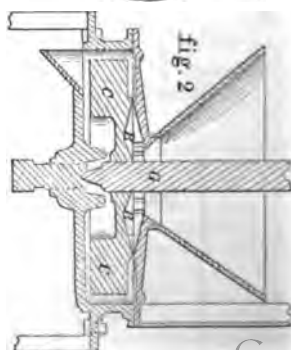
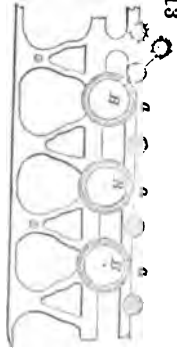


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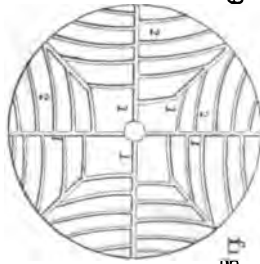
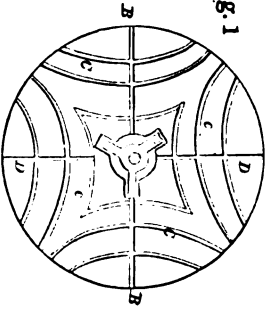
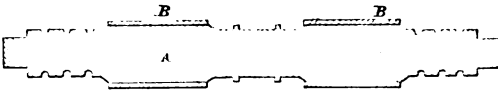


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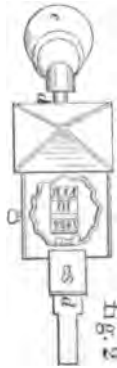


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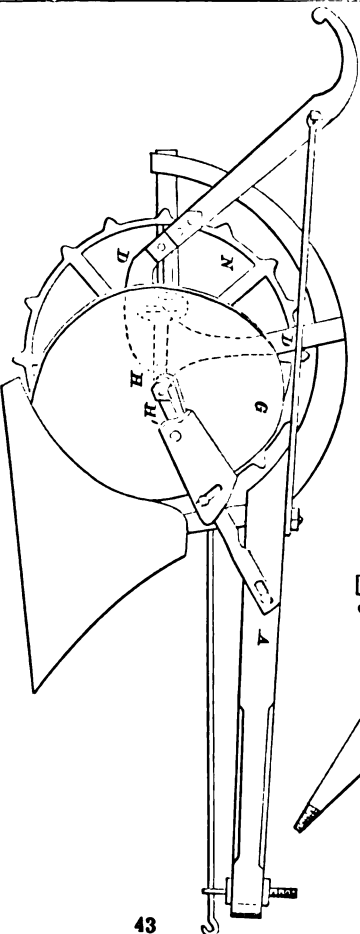
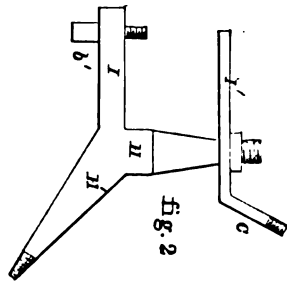
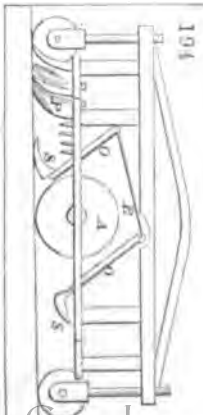


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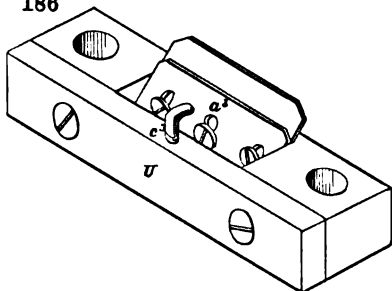


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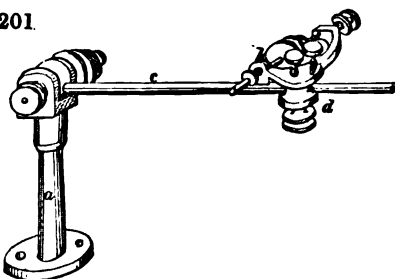
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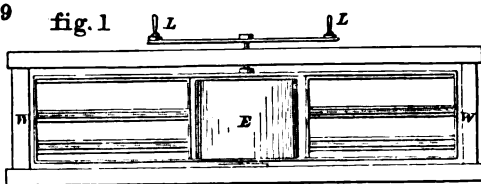


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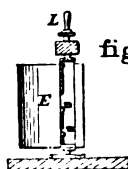
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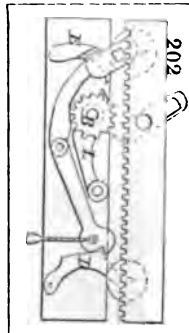
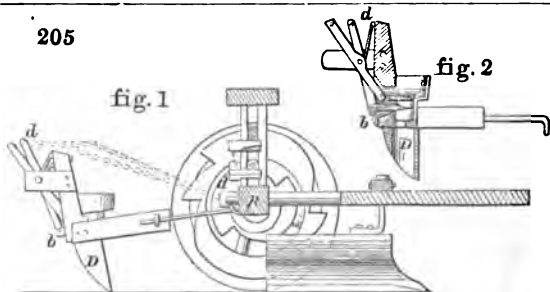
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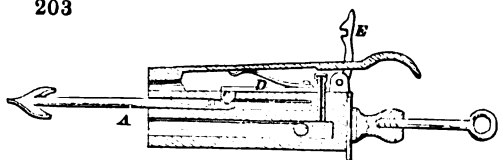
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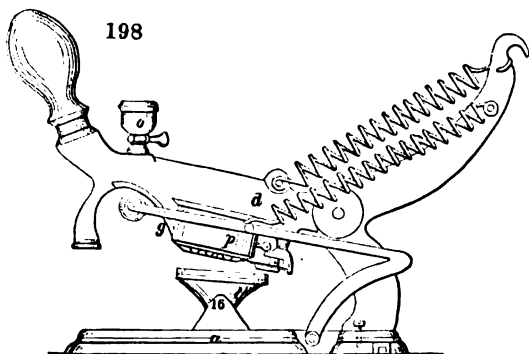
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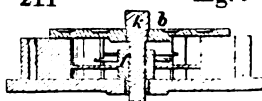
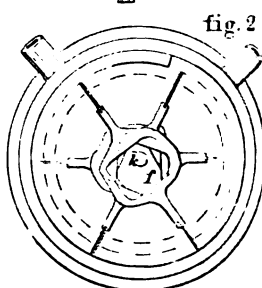


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86	Spring-Gun.....	II, 558	III, 637
87	Hay and Straw-Elevators.....	II, 265	III, 444
88	Wheel Vehicles.....	II, 230	III, 422
89	Apparatus for Ventilating Pulpits.....	I, 760	III, 265
90	Machine for Bending Metal Plates.....	I, 545	III, 135
91	Plotting Instrument.....	II, 101	III, 336
92	Velocipedes.....	II, 231	III, 423
93	Grinding-Mill.....	II, 303	III, 473
94	Chain-Making Machine.....	I, 511	III, 115
95	Railroad Car-Box.....	II, 186	III, 391
96	Steam Valve.....	II, 45	III, 295
97	Cotton-Gin.....	I, 593	III, 168-9
98	Valve Arrangement for Steam-Engines.....	II, 15	III, 277
99	Horse-Power Machine for Cross-Cut Sawing.....	II, 350	III, 505
100	Rotary Steam-Engine.....	II, 10	III, 272
101	Cushion for Billiard-Tables.....	II, 592	III, 655
102	Equalizing Carriage Springs.....	II, 211	III, 411
103	Butter-Worker.....	II, 436	III, 569
104	Excavator.....	II, 131	III, 359
105	Carpenter's Rule.....	II, 104	III, 333
106	Scissors-Sharpener.....	II, 478	III, 594
107	Clothes-Rack.....	II, 474	III, 591
108	Lubricating Journals, &c., by a Pendulum Valve Arrangement.....	II, 269	III, 448
109	Creeper.....	II, 600	III, 658
110	Retaining in proper position the Splitting-Knife in Rattan-Machines.....	II, 347	III, 503
19, 111	Match-Safe.....	I, 744	III, 256

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10, 112	Wagon-Brake.....	II, 232	III, 424
113	Attaching Shafts and Poles to Carriages.....	II, 216	III, 413
114	Gas-Stove.....	I, 756	III, 263
115	Chute for Water-Wheels.....	II, 260	III, 441
116	Telegraphic Cables.....	II, 109	III, 343
117	Churn.....	I, 346	III, 3
118	Hand-Reaper.....	I, 471	III, 92
119	Valves and Passages in Cylinders of Steam-Engines.....	II, 48	III, 297
120	Buttons.....	II, 570	III, 645
121	Lock of Double-Barrelled Guns.....	II, 558	III, 636
122	Seed-Planter.....	I, 443	III, 70
123	Machine for Covering the Heads of Trunk Nails.....	I, 5 3	III, 142
124	Railroad Chair.....	II, 149	III, 369
125	Plough.....	I, 452	III, 77
126	Seed-Planter.....	I, 443	III, 71
127	Construction of Furniture.....	II, 460	III, 583
128	Adjusting two Circular Saws to the Same Plane.....	II, 350	III, 506
129	Sewing-Machine.....	I, 620	III, 188
130	Crozing Plane.....	II, 344	III, 500
131	Chain-Cable Stoppers.....	II, 56	III, 303
132	Application of Electro-Magnetic Batteries to Car-Brakes.....	II, 94	III, 330
133	Rope-Machine.....	I, 618	III, 186
134	Variable Cut-Off for Steam-Engine.....	II, 18	III, 280
135	Sewing-Machine.....	I, 621	III, 190
136	Shingle-Machine.....	II, 361	III, 517-8
137	Harvester.....	I, 368	III, 31
138	Machinery for Forming Brims of Felt Hats.....	I, 600	III, 174
139	Table-Rack for Steamers, Ships, &c.....	II, 76	III, 317
140	Grain Separator.....	I, 379	III, 26
141	Sewing-Machine.....	I, 620	III, 189
142	Corn-Husker.....	I, 354	III, 8
143	File.....	I, 518	III, 119
144	Seeding-Machine.....	I, 474	III, 95
145	Sawing-Machine.....	II, 351	III, 507
146	Portable Railroad Switch.....	II, 173	III, 392
147	Cream-Freezer.....	II, 458	III, 582
148	Threshing-Machine.....	I, 497	III, 108
149	Press for Packing the Pulp of Linseed, &c.....	II, 277	III, 454
150	Gas-Tube Joint.....	I, 579	III, 159
151	Cranberry Separators.....	I, 364	III, 17
152	Double Seaming-Machine.....	I, 572	III, 155
153	Compound Pendulum.....	II, 100	III, 336
154	Cut-Off for Steam-Engines.....	II, 16	III, 278
155	Sewing-Machine.....	I, 621	III, 190
156	Feeding Millstones.....	I, 310	III, 479
157	Railroad Car-Brake.....	II, 187	III, 393
158	Lamp or Candlestick and Match-Box.....	I, 734	III, 250
159	Connecting the Panels of Field Fences.....	II, 137	III, 363
160	Corn-Sheller.....	I, 359	III, 13
161	Spinning-Machine.....	I, 655	III, 211
162	Ratchet Movement for Screw-Drivers.....	I, 569	III, 153
163	Plough.....	I, 452	III, 77
164	Carpet-Fastener.....	II, 441	III, 571
165	Joints of Railroad Tracks.....	II, 159	III, 374
166	Feeding and Giggling Back the Carriage in Circular Sawing-Machines.....	II, 356	III, 512
167	Butting and Pointing Shingle-Bolts.....	II, 367	III, 525
168	Scroll Sawing-Machine.....	II, 356	III, 511
169	Combined Horse Collar and Hames.....	II, 400	III, 549
170	Window-Blind Fixtures.....	II, 119	III, 349
10, 171	Sewing-Machine.....	I, 620	III, 189



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19, 172	Restoring Waste Vulcanized Rubber.....	I, 693	-----
173	Pump Bucket.....	II, 251	III, 436
174	Construction of Marquetry Floors.....	II, 138	III, 363
175	Coal-Screen.....	I, 704	III, 234
176	Registering Speed of Railroad Trains by Electro-Galvanic Batteries.....	II, 93	III, 329
177	Steam Spring-Pressure Gauge.....	II, 21	III, 222
178	Potato-Planter.....	I, 442	III, 69
179	Plough.....	I, 453	III, 78
180	Rotary Pump.....	II, 253	III, 437
181	Washing-Machine.....	II, 486	III, 598
182	Air-tight Pepper Box.....	II, 471	III, 589
183	Obtaining and Preserving Power from Trains at Stations..	II, 316	III, 422
184	Apparatus for Dyeing Yarn in the Skein.....	I, 671	III, 218
185	Gas-Heating Apparatus.....	I, 720	III, 242
186	Railroad Car-Coupling.....	II, 193	III, 399
187	Musical Wind Instrument.....	II, 511	III, 612
188	Curry-Comb.....	I, 512	III, 116
189	Machine for Ploughing.....	I, 466	III, 88
190	Art of Making Brooms.....	II, 433	III, 567
191	Bade for Pencil Sharpeners.....	II, 520	III, 617
192	Railroad Car Brake.....	II, 188	III, 392
193	Effecting the Taper in Shingle-Machines.....	II, 365	III, 523
194	Pug Mill.....	II, 390	III, 543
195	Machine for Planing Away Ice in Rivers.....	II, 606	III, 661
196	Tidal Alarm.....	II, 587	III, 653
197	Heaters or Coolers.....	I, 721	III, 243
198	Corn-Planter.....	I, 434	III, 63
199	Shingle-Machine.....	II, 362	III, 518
200	Straw Cutter.....	I, 490	III, 105
201	Tanning Leather.....	II, 417	-----
202	Cotton-Press.....	II, 273	III, 451
203	Steam Throttle-Valve.....	II, 47	III, 296
204	Railroad Car-Coupling.....	II, 193	III, 400
205	Spur to Prevent Slipping on Ice.....	II, 604	III, 661
206	Hydrant.....	II, 241	III, 430
207	Lantern.....	I, 736	III, 251
208	Padlock.....	I, 542	III, 133
209	Galvanic Battery.....	II, 96	III, 333
210	Mash for Distillation.....	I, 670	III, 217
211	Apparatus for Tanning Skins.....	II, 418	III, 559
212	Raking and Binding Devices for Harvesters.....	I, 419	III, 53
213	Nipple-Guard of Fire-Arms.....	II, 549	III, 632
214	Water-Wheel.....	II, 257	III, 439
215	Ploughing-Machine.....	I, 466	III, 87
216	Canvas Sheets Connected with Life-Preserving Rafts.....	II, 62	III, 317
217	Weather Strip for Doors.....	II, 126	III, 356
218	Harvester.....	I, 389	III, 38
219	Railroad Car-Spring.....	II, 205	III, 407
220	Passages and Valves for Cushioning Pistons of Steam-Engines	II, 16	III, 276
221	Corn-Harvesters.....	I, 409	III, 45
222	Seed-Planter.....	I, 444	III, 71
223	Railroad Car-Brake.....	II, 188	III, 394
224	Hydraulic Engine.....	II, 244	III, 431
225	Reefing Topsails.....	II, 73	III, 313
226	Window-Shade Fixtures.....	II, 497	III, 605
227	Securing Straps upon Boot Legs.....	II, 394	III, 545
228	Clamp for Holding Ladies' Hair in Curl.....	II, 572	III, 645
229	Tool for Manufacturing Splint Baskets.....	II, 589	III, 654
230	Carpet-Stretcher.....	II, 442	III, 572
19, 231	Machine for Forming Bonnet Frames.....	I, 584	III, 163

No.	Invention or Discovery.	Text.	Plates.
19, 232	Jack-Screw Press .....	II, 278	III, 456
233	Shingle-Machine .....	II, 362	III, 518
234	Cultivator Teeth .....	I, 373	III, 21
235	Forming the Bat for Making Felt Cloth .....	I, 587	.....
236	Brick-Machine .....	II, 379	III, 534
237	Reducing the Friction of Journals of Axles on Railways .....	II, 143	III, 366
238	Bread Cutter .....	II, 433	III, 567
239	Hot-Air Furnace .....	I, 713	III, 239
240	Stove .....	I, 745	III, 257
241	Laying Railroad Tracks .....	II, 158	III, 374
242	Corn Planter .....	I, 434	III, 63
243	Wheelwrights' Machine .....	II, 375	III, 531
244	Gumming and Jointing Saws .....	I, 567	III, 151
245	Attaching the Electrodes to the Poles of Galvanic Batteries .....	II, 96	III, 333
246	Gold Amalgamator .....	I, 501	III, 110
247	Rotary Steam-Engine .....	II, 10	III, 271
248	Cultivator .....	I, 365	III, 18
249	Damper Regulator .....	I, 705	III, 235
250	Apparatus for Hoisting Ice .....	II, 266	III, 445
251	Grain Mill .....	II, 302	III, 472
252	Plate Frame for Photographic Cameras .....	II, 521	III, 617
253	Corn Sheller .....	I, 359	III, 13
254	Invalid Bedstead .....	II, 429	III, 564
255	Hemp-Brakes .....	I, 600	III, 175
256	Tobacco Press .....	II, 278	III, 455
257	Washing Machine .....	II, 486	III, 598
258	Flasks for Casting Wheels .....	I, 510	III, 114
259	Harrow .....	I, 383	III, 29
260	Railroad Car-Brake .....	II, 188	III, 395
261	Making Railway Bars .....	I, 504	III, 111
262	Plough .....	I, 453	III, 78
263	Safety Winch .....	II, 284	III, 460
264	Adjustable Carriage Braces for Carriages .....	II, 215	III, 413
265	Saw Gummer .....	I, 265	III, 150
266	Lump .....	I, 723	III, 244
267	Fastening for Widow-Sashes .....	II, 182	III, 389
268	Turning-Table for Railways .....	II, 166	III, 378
269	Water-Proof Gaiter Shoes and Boots .....	II, 399	III, 548
270	Angular Paper Boxes .....	I, 613	III, 183
271	Machine for Draughting Garments .....	II, 572	III, 645
272	Shifting Belts .....	II, 285	III, 461
273	Dressing Millstones .....	II, 310	III, 479
274	Seed-Planters .....	I, 444	III, 72
275	Feeding the Bolt in Shingle-Machines .....	II, 365	III, 524
276	Operating Pistons of Pumps .....	II, 255	III, 439
277	Furnace for Locomotives .....	I, 711	III, 238
278	Apparatus for Paying Out Telegraphic Cables .....	II, 107	III, 342
279	Cotton Press .....	II, 273	III, 451
280	Diaper or Shawl Pin .....	II, 573	III, 646
281	Harrow .....	I, 383	III, 28
282	Preparing Blanks for Shoe Pegs .....	II, 414	III, 557
283	Sewing Silk .....	I, 652	III, 210
284	Implement for Holding Open Shoes, Bags, &c. .....	II, 415	III, 558
285	Sewing-Machine .....	I, 621	III, 191
286	Pump .....	II, 247	III, 433
287	Hydro-Carbon Vapor Lamp .....	I, 733	III, 249
288	Cards for Currying Cattle .....	I, 346	III, 2
289	Grinding Mill .....	II, 303	III, 474
290	Railroad Car Axle Box .....	II, 185	III, 390
291	Lubricating Apparatus for Journal Boxes of Railroad Cars .....	II, 269	III, 447
19, 292	Machine for Cutting Tenons on Spokes .....	II, 372	III, 529

No.	Invention or Discovery.	Text.	Plates.
19, 293	Shingle-Machine . . . . .	II, 362	III, 519
294	Potato-Planter . . . . .	I, 442	III, 69
295	Alarm Lock . . . . .	II, 586	III, 652
296	Musical Instruments . . . . .	II, 510	III, 611
297	Hominy Mill . . . . .	II, 307	III, 477
298	Harvester . . . . .	I, 329	III, 32
299	Washing-Machine . . . . .	II, 487	III, 599
300	Straining Reciprocating Saws . . . . .	II, 360	III, 515
301	Removable Window-Sash . . . . .	II, 182	III, 389
302	Scrapers for Grinding Mills . . . . .	II, 313	III, 480
303	Flour Bolts . . . . .	II, 286	III, 463
304	Operating Railroad Station Pumps . . . . .	II, 157	III, 373
305	Attaching India-Rubber Soles to Boots and Shoes . . . . .	II, 398	III, 548
306	Wrought-Iron Railroad Chair . . . . .	II, 151	III, 371
307	Clamp for Rectangular Pieces of Wood, while being bored, &c . . . . .	II, 376	III, 532
308	Stave-Machine . . . . .	II, 369	III, 527
309	Burning Brick . . . . .	II, 346	III, 540
310	Churn . . . . .	I, 347	III, 3
311	Machine for Cutting Brush from Cotton Fields . . . . .	I, 364	III, 16
312	Pedals for Organs, &c . . . . .	II, 512	III, 613
313	Lead Pipe-Machine . . . . .	I, 559	III, 146
314	Joints for Sheet Metal Roofs . . . . .	II, 170	III, 379
315	Washing-Machine . . . . .	II, 487	III, 598
316	Painting and Varnishing-Machine . . . . .	II, 512	III, 613
317	Collapsible Boats . . . . .	II, 53	III, 301
318	Lap Joints for Belting . . . . .	II, 284	III, 461
319	Harvester, Grain and Grass . . . . .	I, 414	III, 49
320	Corn-Husker . . . . .	I, 355	III, 9
321	Plough . . . . .	I, 453	III, 78
322	Machine for Planting Potatoes . . . . .	I, 452	III, 76
323	Bottle Stopper . . . . .	II, 594	III, 655
324	Cotton-Gin . . . . .	I, 594	III, 170
325	Corn-Husker . . . . .	I, 354	III, 8
326	Corn-Husker . . . . .	I, 355	III, 9
327	Fire-Arm . . . . .	II, 545	III, 630
328	Cane-Gun . . . . .	II, 536	III, 635
329	Hand Corn-Planter . . . . .	I, 440	III, 67
330	Hydrant . . . . .	II, 242	III, 430
331	Connecting the Trucks of Railroad Cars . . . . .	II, 224	III, 418
332	Signal Lantern . . . . .	II, 75	III, 316
333	Seeding-Machine . . . . .	I, 474	III, 96
334	Churn . . . . .	I, 347	I, 4
335	Filtering Apparatus . . . . .	II, 234	III, 428
336	Rollers for Window-Shades . . . . .	II, 498	III, 605
337	Ore-Washer . . . . .	I, 520	III, 121
338	Gold-Washer . . . . .	I, 557	III, 145
339	Railroad Snow-Plough . . . . .	II, 155	III, 373
340	Hanger for Shafting . . . . .	II, 320	III, 485
341	Machine for Making Cigars . . . . .	II, 597	III, 657
342	Powder-Flask . . . . .	II, 559	III, 638
343	Rotary Blast-Producing Chair . . . . .	II, 447	III, 575
344	Harvester . . . . .	I, 329	III, 33
345	Cutting Key-Boards, &c., for Musical Instruments . . . . .	II, 510	III, 611
346	Propelling Canal Boats . . . . .	II, 55	III, 302
347	India Rubber Door-Mat . . . . .	II, 466	III, 586
348	Metallic Window-Shutters . . . . .	II, 143	III, 389
349	Shingle-Machine . . . . .	II, 363	III, 521
350	Life-Preserving Mattress . . . . .	II, 61	III, 306
351	Public Clock . . . . .	II, 89	III, 327
19, 352	Rocking-Chairs . . . . .	II, 447	III, 574

No.	Invention or Discovery.	Text.	Plates.
19, 353	Field-Fence.....	II, 132	III, 360
354	Holding Horse-Reins .....	II, 411	III, 555
355	Trap for Catching Rats and other Animals .....	II, 616	III, 667
356	Surveyors' Protractor.....	II, 106	III, 341
357	Tree Protectors.....	I, 499	III, 109
358	Fire-Box and Grate .....	I, 706	III, 235
359	Securing the Plane-Iron to its Stock.....	II, 344	III, 500
360	Cutter for Harvesters.....	I, 412	III, 48
361	Railroad Snow-Plough .....	II, 155	III, 372
362	Window-Frame .....	II, 181	III, 388
363	Harpoon and Lance .....	II, 58	III, 304
364	Tools for Clenching Nails.....	I, 553	III, 141
365	Revolving Harrow.....	I, 386	III, 30
366	Brick-Machine .....	II, 380	III, 535
367	Reaping and Mowing-Machine.....	I, 471	III, 91
368	Water-Backs for Ranges .....	I, 742	III, 255
369	Caster for Furniture.....	II, 460	III, 564
370	Knitting-Machine.....	I, 614	III, 176
371	Harness Tree.....	II, 405	III, 551
372	Extension Reach for Wagons .....	II, 233	III, 425
373	Refrigerator .....	II, 475	III, 591
374	Hinge.....	I, 522	III, 422
375	Water Closet .....	II, 123	III, 354
376	Ice-Spur .....	II, 606	III, 662
377	Harvester .....	I, 389	III, 33
378	Raking-Attachment for Harvesters .....	I, 420	III, 55
379	Receiving Magnet .....	II, 99	III, 334
380	Railroad Car Wheel .....	II, 217	III, 408
381	Cotton-Press.....	II, 274	III, 452
382	Fly-Trap .....	II, 614	III, 666
383	Furling the Sails of Wind-Wheels.....	II, 262	III, 442
384	Bank-Check Cancellor.....	II, 589	III, 654
385	Lubricator .....	II, 270	III, 449
386	Mill Burhes.....	II, 296	III, 468
387	Repeating Fire-Arm .....	II, 549	III, 632
388	Plough.....	I, 454	III, 79
389	Churn .....	I, 347	III, 4
390	Ironing Table.....	II, 4-2	III, 596
391	Plough .....	I, 454	III, 79
392	Gravimotometer.....	II, 97	III, 334
393	Raking-Attachment for Harvester.....	I, 420	III, 55
394	Drawing Cotton, &c.....	I, 591	III, 166
395	Rest-Attachment for Lathes .....	II, 340	III, 497
396	Carriage Spring Guard .....	II, 211	III, 410
397	Railroad Safety-Switches.....	II, 175	III, 333
398	Hydraulic Valve.....	II, 244	III, 432
399	Cotton-Press.....	II, 274	III, 452
400	Steam Pressure Gauge.....	II, 21	III, 281
401	Plough .....	I, 454	III, 79
402	Apple-Corer .....	II, 420	III, 560
403	Cable Stopper.....	II, 56	III, 302
404	Seed-Planter.....	I, 444	III, 72
405	Method of Manufacturing Furniture.....	II, 461	III, 564
406	Dovetailing Tool .....	II, 333	III, 492
407	Stone Dressing Machine.....	II, 30	III, 542
408	Wheel and Axle-Attachment of Horse-Power, &c.....	II, 295	III, 467
409	Sewing Machine .....	I, 622	III, 191
410	Spring Bed Bottom.....	II, 424	III, 561
411	Harvester .....	I, 390	III, 34
412	Shovel-Plough.....	I, 465	III, 86
19, 413	Cotton-Press.....	II, 274	III, 453

No.	Invention or Discovery.	Text.	Plates.
19, 414	Water-Metre .....	II, 246	III, 432
415	Cotton-Gin .....	I, 594	III, 170
416	Expanding Tool .....	I, 578	III, 159
417	Cotton-Gin .....	I, 594	III, 171
418	Substitute for Infants' Diapers .....	II, 571	III, 645
419	Culinary Ladle .....	II, 465	III, 586
420	Horse-Rake .....	I, 469	III, 90
421	Cider-Mill .....	II, 297	III, 469
422	Harvester .....	I, 391	III, 34
423	Seeding-Machine .....	I, 475	III, 96
424	Journal-Box .....	II, 225	III, 419
425	Straw-Cutter .....	I, 491	III, 135
426	Snow Plough .....	II, 171	III, 380
427	Steam Plough .....	I, 465	III, 86
428	Picker for Looms .....	I, 611	III, 190
429	Machine for Splitting Coal .....	I, 704	III, 234
430	Machine for Gathering Stones .....	I, 489	III, 104
431	Machine for Sowing Fertilizers .....	I, 488	III, 103
432	Table Refrigerator .....	II, 477	III, 593
433	Construction of Permanent Way of Railroads .....	II, 160	III, 375
434	Connecting the Panels of Field Fences .....	II, 137	III, 362
435	Railroad Car Spring .....	II, 205	III, 407
436	Fire-Tongs .....	I, 759	III, 265
437	Cotton Bale Hoops .....	II, 263	III, 448
438	Cotton Seed-Planter .....	I, 438	III, 66
439	Sewing Machine .....	I, 622	III, 192
440	Railroad Track Clearers .....	II, 158	III, 374
441	Grain Mill .....	II, 302	III, 474
442	Harvesters .....	I, 391	III, 34
443	Rotary Valve .....	II, 43	III, 294
444	Stave-Machine .....	II, 369	III, 527
445	Railroad Car Wheel .....	II, 207	III, 408
446	Box for Receiving Money in Carriages .....	II, 216	III, 414
447	Harvester .....	I, 340	III, 33
448	Railroad Car-Spring .....	II, 205	III, 407
449	Wardrobe Bedstead .....	II, 431	III, 565
450	Volute Springs .....	II, 229	III, 421
451	Fastening of Cast-Iron Bedsteads .....	II, 427	III, 563
452	Spike-Machine .....	I, 574	III, 156
453	[Suspended] .....		
454	Saw-Mill .....	II, 348	III, 503
455	Plough .....	I, 454	III, 79
456	Seed-Planter .....	I, 444	III, 71
457	Garden Tool .....	I, 377	III, 24
458	Corn-Husker .....	I, 355	III, 9
459	Whitewash Brush-Blocks .....	II, 435	III, 567
460	Lighting Gas by Electro-Galvanic Batteries .....	II, 93	III, 329
461	Shoe-Peg Machine .....	II, 412	III, 556
462	Straw-Cutter .....	I, 491	III, 105
463	Harvester .....	I, 390	III, 34
464	Oscillating Steam-Engine .....	II, 14	III, 276
465	Carpet-Beating Machine .....	II, 440	III, 571
466	Weighing Mechanism Applied to Carts of Coal Dealers and others .....	II, 283	III, 460
467	Scissors-Sharpener .....	II, 478	III, 594
468	Attaching Legs to Walking Locomotives .....	II, 30	III, 287
469	Carrying off Smoke from Locomotives in Engine-Houses .....	II, 29	III, 287
470	Brick-Machine .....	II, 380	III, 536
471	Omnibus Fare-Box .....	II, 246	III, 419
472	Lathe for Cutting Tenons for Clock Movements .....	II, 89	III, 326
19, 473	Bed-Bottom .....	II, 423	III, 561

No.	Invention or Discovery.	Text.	Plates.
19, 474	Washing-Machine.....	II, 487	III, 599
475	Bellows.....	II, 235	III, 426
476	Machine for Stoning Cherries.....	II, 448	III, 576
477	Manure-Wagon.....	II, 232	III, 423
478	Metallic Carriage Wheel.....	II, 214	III, 412
479	Compound Pendulum.....	II, 101	III, 336
480	Bending Shovel-Handles.....	II, 329	III, 489
481	Machine for Breaking Coal.....	I, 703	III, 233
482	Paddle-Wheel.....	II, 64	III, 308
483	Harvester.....	I, 392	III, 35
484	Eccentric for Operating Steam-Valves.....	II, 46	III, 296
485	Bolt-Machine.....	I, 505	III, 112
486	Harvester.....	I, 391	III, 35
487	Metallic Lathing.....	II, 143	III, 367
4-8	Operating Window-Blinds.....	II, 180	III, 357
489	Harrow.....	I, 381	III, 29
490	Metallic Ties for Cotton Bales.....	II, 263	III, 443
491	Field Fence.....	II, 132	III, 360
492	Machine for Cutting the Moulding for Sash.....	II, 343	III, 499
493	Apparatus for Supplying Water to Boilers.....	II, 3	III, 267
494	Harrow.....	I, 384	III, 29
495	Alarm Sash-Balance.....	II, 5-7	III, 652
496	Hill-side Plough.....	I, 461	III, 85
497	Loop-Chain for Jewelry.....	II, 509	III, 610
498	Shaping and Punching Metals.....	I, 547	III, 137
499	Farm Gate.....	II, 139	III, 364
500	Raising Sunken Vessels.....	II, 83	III, 321
501	Sash-Fastener.....	I, 515	III, 117
502	Register for Hot-Air Furnaces.....	I, 714	III, 240
503	Coffin.....	II, 595	III, 657
504	Mowing-Machine.....	I, 431	III, 61
505	Eccentric Explosive Shell.....	II, 561	III, 638
506	Machine for Making Paper Bags.....	II, 513	III, 614
507	Hominy Mortar.....	II, 461	III, 584
508	Boot-Trees.....	II, 395	III, 546
509	Machine for Cutting Barrel-Heads.....	II, 326	III, 488
510	Machine for Cutting Barrel-Heads.....	II, 326	III, 488
511	Hydrant.....	II, 242	III, 431
512	Corn-Husker.....	I, 355	III, 10
513	Hydrant.....	II, 212	III, 431
514	Seeding-Machine.....	I, 475	III, 96
515	Method of Setting Sugar-Kettles.....	I, 697	III, 230
516	Submarine Grapples.....	II, 57	III, 303
517	Machine for Forming Sheet-Metal Pans.....	I, 544	III, 134
518	Finger-Harvester.....	I, 414	III, 49
519	Calendar Clock.....	II, 89	III, 326
520	Bee-Hive.....	I, 313	III, 1
521	Grinding-Mill.....	II, 313	III, 475
522	Harvester.....	I, 391	III, 35
523	Rake for Harvester.....	I, 417	III, 51
524	Scythes.....	I, 572	III, 154
525	Lime Kiln.....	II, 398	III, 541
526	Horse-Shoe.....	I, 525	III, 122
527	Burglars' Alarm.....	II, 583	III, 650
528	Horse-Shoe Machine.....	I, 525	III, 124
529	Piano Lock.....	I, 512	III, 133
530	Boxes and Journals for Railroad Car-Axles.....	II, 186	III, 391
531	Regulating the Supply of Spinning-Machines.....	I, 655	III, 212
532	Sewing-Machine.....	I, 532	III, 192
533	Lock.....	I, 532	III, 128
19, 534	Operating Scroll-Saws.....	II, 361	III, 516

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19, 535	Sewing-Machine .....	I, 622	III, 193
536	Sawing-Machine .....	II, 351	III, 506
537	Rotary Steam Engine .....	II, 11	III, 272
538	Method of Bending several pieces of Wood of unequal lengths at once .....	II, 377	III, 533
539	Floor-Plane .....	II, 344	III, 500
540	Hand Corn-Planter .....	I, 441	III, 68
541	Mill for Reducing Substances .....	II, 301	.....
542	Artificial Skins .....	II, 416	III, 558
543	Machine for Mining Coal .....	II, 144	III, 367
544	Bedstead Fastenings .....	II, 427	III, 563
545	Sugar and Cider Mills .....	II, 312	III, 479
546	Billiard Table Tops or Beds .....	II, 593	III, 655
547	Meat-Cutter .....	II, 467	III, 587
548	Tightening Keys of the Journal-Boxes of Connecting Rods .....	II, 226	III, 419
549	Hand-Planter .....	I, 445	III, 72
550	Machine for Fitting Wagon-Tires .....	II, 233	III, 425
551	Lubricating the Axle-Boxes of Carriage-Wheels .....	II, 270	III, 449
552	Corn-Husker .....	I, 356	III, 10
553	Repeating Fire-Arm .....	II, 550	III, 633
554	Machinery for Manufacturing Plaited Cord .....	I, 688	III, 165
555	Splice Joints of Railroad Rails .....	II, 155	III, 372
556	Pin-Sticking Machine .....	I, 557	III, 145
557	Machine for Hulling Rice .....	I, 429	III, 60
558	"Fifth Wheel" for Vehicles .....	II, 230	III, 421
559	Grinding-Mill .....	II, 304	III, 473
560	Curtain Fixture .....	II, 455	III, 580
561	Machine for Cutting and Crushing Corn-Stalks .....	I, 363	III, 16
562	Stump-Extractor .....	II, 173	III, 382
563	Plough .....	I, 455	III, 79
564	Lock .....	I, 533	III, 128
565	Machine for Excavating Post-Holes .....	II, 131	III, 359
566	Field Fence .....	II, 132	III, 360
567	Attaching the Springs of Vehicles .....	II, 230	III, 421
568	Safety Apparatus for Steam-Boilers .....	II, 6	III, 269
569	Machinery for Polishing Glass .....	II, 3-8	III, 541
570	Safety-Valve .....	II, 43	III, 295
571	Cotton-Press .....	II, 275	III, 453
572	Machine for Packing Flour .....	II, 271	III, 449
573	Constructing Framing of Bridges .....	II, 123	III, 333
574	Operating Brakes of Railroad Cars .....	II, 221	III, 417
575	Manufacture of Gas .....	I, 678	III, 222
576	Skirt Supporter .....	II, 579	III, 618
577	Snow-Plough .....	II, 172	III, 391
578	Attaching Metallic Letter-Boxes to Lamp-Posts .....	II, 606	III, 662
579	Seed-Planter .....	I, 445	III, 72
580	Apparatus for Containing and Igniting Cigar-Lighting Cinders .....	II, 597	III, 656
581	Rotary-Pump .....	II, 253	III, 438
582	Spring-Seats of Chairs, Sofas, &c. ....	II, 448	.....
583	Enamelling Leather .....	II, 407	III, 553
584	Cultivator .....	I, 365	III, 18
585	Clothing for Carding Cylinders .....	I, 586	III, 164
586	Vertical and Horizontal Reciprocating-Motion .....	II, 315	III, 481
587	Grinding-Mill .....	II, 304	III, 474
588	Window-Fastener .....	I, 517	III, 119
589	Mathematical Divider .....	II, 91	III, 328
590	Harvester .....	I, 392	III, 35
591	Hot-Water Radiators .....	I, 740	III, 253
592	Iron Pavement .....	II, 145	III, 367
19, 593	Life-Preserver Raft of Buoyant Mattresses .....	II, 62	III, 306

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19, 594	Valve for Steam-Engines .....	II, 39	III, 292
595	Bench Hook .....	II, 329	III, 489
596	Carpet-Stretcher .....	II, 442	III, 572
597	Trenching-Plough .....	II, 175	III, 384
598	Cotton-Gin .....	I, 595	III, 171
599	Railroad Car-Brake .....	II, 168	III, 394
600	Machine for Picking Fibrous Material .....	I, 592	III, 167
601	Steam-Boiler .....	II, 1	III, 266
602	Construction of Military Drums .....	II, 502	III, 608
603	Corn-Shelling Machine .....	I, 359	III, 13
604	Generating Steam with Atmospheric Air as a Motive Power .....	II, 35	III, 290
605	Dress of Stones for Hulling-Mills .....	II, 313	III, 480
606	Attaching Tools to Handles .....	I, 578	III, 159
607	Pentographic Engraving-Machine .....	II, 503	III, 608
608	Match-Machine .....	II, 607	III, 663
609	Washing-Machine .....	II, 488	III, 600
610	Raising Dough .....	II, 457	III, 580
611	Pricking and cutting Heels of Boots and Shoes .....	II, 398	III, 547
612	Sewing-Machine .....	I, 623	III, 192
613	Inkstand .....	II, 507	III, 609
614	Latch for Doors .....	I, 532	III, 128
615	Grain-Winnower .....	I, 500	III, 109
616	Ventilating-Hats .....	I, 600	III, 173
617	Seed-Drill .....	I, 373	III, 22
618	Life-Preserving Buoy .....	II, 61	III, 306
619	Machine for Planing Blind-Slats .....	II, 345	III, 500
620	Joiners' Bevelling-Plane .....	II, 345	III, 500
621	Steam-Boiler .....	II, 1	III, 266
622	Vise .....	I, 580	III, 160
623	Calender-Rolls .....	I, 617	III, 185
624	Mounting Fluid-Lenses .....	II, 509	III, 610
625	Textile Hose .....	I, 603	III, 177
626	Photolithography .....	II, 522	III, 618
627	Roofing Cement .....	II, 166	.....
628	Lock .....	I, 533	.....
629	Separator and Smut-Machine .....	II, 318	III, 484
630	Wrought-Iron Girders .....	II, 142	III, 365
631	Cut-Nail Machine .....	I, 549	III, 139
632	Life-Preserving Float .....	II, 61	III, 306
633	Seed-Drill .....	I, 373	III, 22
634	Washing-Machine .....	II, 483	III, 600
635	Apparatus for Drying Fruit .....	II, 459	III, 581
636	Blow-Pipe .....	I, 700	III, 232
637	Grain-Separators and Cleaners .....	II, 318	III, 484
638	Combined Floating-Anchor and Life-Preserver .....	II, 51	III, 300
639	Attaching the Glasses of Vault-Covers .....	II, 176	III, 385
640	Operating Valves in Steam-Engines .....	II, 49	III, 298
641	Holder for Planing-Knives while grinding .....	I, 531	III, 127
642	Measuring and Regulating the Intensity of Electric Currents .....	II, 92	III, 328
643	Grain-Cradle .....	I, 378	III, 25
644	Sawing-Machine .....	II, 351	III, 508
645	Picturetypes .....	II, 540	.....
646	Door-Register .....	II, 125	III, 355
647	Spinning-Bobbins .....	I, 584	III, 163
648	Milking-Pail .....	II, 470	III, 588
649	Spring-Bedstead .....	II, 430	III, 565
650	Cooking-Stove .....	I, 751	III, 259
651	Cooking-Stove .....	I, 751	III, 260
652	Gang-Plough .....	I, 462	III, 669
653	Washing-Machine .....	II, 488	III, 599
19, 654	Machine for Trimming Books .....	II, 500	III, 607



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19, 655	Portable Gas-Retort.....	I, 684	III, 286
656	Canal-Boat Propeller.....	II, 54	III, 301
657	Preparing Silk for use with Felting Substances.....	I, 689	.....
658	Plough.....	I, 455	III, 669
659	Anchor.....	II, 51	III, 340
660	Sewing-Machine.....	I, 623	III, 192
661	Metallic Sash.....	II, 170	III, 379
662	Sewing-Machine.....	I, 623	III, 193
663	Dumping-Box for Agricultural Purposes.....	I, 376	III, 24
664	Let off Motion for Power Looms.....	I, 612	III, 182
665	Sewing Machine.....	I, 624	III, 193
666	Devices for Lowering and Detaching Boats.....	II, 54	III, 302
667	Process of Making Soap.....	I, 695	.....
668	Graphite in Reducing Metals.....	I, 686	.....
669	Steam Boiler.....	II, 1	III, 266
670	Machine for Crushing Ore.....	I, 556	III, 144
671	Pump.....	II, 247	III, 433
672	Printing Press.....	II, 529	III, 622
673	Self-Adjusting Door Sill.....	II, 126	III, 355
674	Walking-Stick Gun.....	II, 559	III, 637
675	Railroad Rail.....	II, 153	III, 371
676	Securing the Wheels of Carriages.....	II, 216	III, 414
677	Casting Metallic Cheese Hoops.....	I, 546	III, 737
678	Self-Adjusting Damper for Hot-Air Furnaces.....	I, 715	III, 240
679	Cotton-Gin.....	I, 595	III, 171
680	Oscillating Pump.....	II, 252	III, 436
681	Meat Chopper.....	II, 467	III, 587
682	Fire Proof Ceiling.....	II, 123	III, 353
683	Hot-Air Furnace.....	I, 713	III, 239
684	Sewing-Machine.....	I, 624	III, 193
685	Connecting the Sections of Metallic Funnels.....	II, 176	III, 384
686	Method of Cleaning Gas Generators.....	I, 677	III, 222
687	Binding Attachment to Reapers.....	I, 471	III, 91
688	Machine for Cutting the Leaves from the Sugar [Cane].....	II, 291	III, 465
689	Haycock Protector.....	I, 425	III, 58
690	Regulator for Roving or Yarn.....	I, 659	III, 215
691	Hominy Mill.....	II, 307	III, 477
692	Machine for Sawing Staves.....	II, 353	III, 514
693	Metallic Boats.....	II, 54	III, 301
694	Water-Tight Washstand.....	II, 486	III, 597
695	Roofing Cement Composition.....	II, 167	.....
696	Grinding Attachment to Pug Mills.....	II, 308	III, 477
697	Rotary Engine.....	II, 11	III, 272
698	Ribbon Loom.....	I, 612	III, 182
699	Pump.....	II, 247	III, 433
700	Holding Bolt for Carpenters' Brackets.....	II, 332	III, 490
701	Dyeing Yarn Parti-Colored.....	I, 672	III, 219
702	Clamping Polyginal Pieces in Planing-Machines.....	II, 346	III, 502
703	Harvesters.....	I, 392	III, 36
704	Superstructure of Railways.....	II, 165	III, 377
705	Railroad Car-Coupling.....	II, 149	III, 369
706	Plough.....	I, 455	III, 80
707	Graphotype.....	II, 506	.....
708	Press for Extracting Oil from Linseed.....	II, 277	III, 454
709	Cotton Bale Ties.....	II, 263	III, 443
710	Compounds for Hardening Iron and Steel.....	I, 668	.....
711	Machine for Turning Tool Handles, &c.....	II, 374	III, 530
712	Cement Composition for Roofing.....	II, 167	.....
713	Stove-Heating Apparatus.....	I, 757	III, 264
714	Cotton Press.....	II, 275	III, 453
19, 715	Revolving Cylinder Steam Engine.....	II, 15	III, 275

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19, 716	Corn Harvester .....	I, 409	III, 45
717	Cigar-Lighting Cinders .....	II, 596	.....
718	Turning and Sliding Tables for Railroads .....	II, 169	III, 375
719	Stop Motion for Hair-Cloth Looms .....	I, 610	III, 180
720	Gas-Burner .....	I, 716	III, 240
721	Tightening the Tires of Carriage Wheels .....	II, 215	III, 413
722	Pistons and Piston-Rod Connexions .....	II, 30	III, 288
723	Sewing-Machine .....	I, 624	III, 193
724	Field Fence .....	II, 135	III, 361
725	Plough .....	I, 455	III, 80
726	Reciprocating and Rotary Motion .....	II, 314	III, 481
727	Mill Fash .....	II, 297	III, 469
728	Meat-Cutting Machine .....	II, 469	III, 5e8
729	Composition for Varnishes .....	I, 698	.....
730	Shoe Pegs .....	II, 412	III, 556
731	Steam-Gauge .....	II, 20	III, 281
732	Sewing-Machine .....	I, 624	III, 193
733	Cream Freezer .....	II, 458	III, 581
734	Railroad Car-Brake .....	II, 189	III, 393
735	Belt Coupling .....	II, 284	III, 461
736	Tracks for City Railways .....	II, 165	III, 377
737	Ship's Bulkhead .....	II, 74	III, 316
738	Egg Beater .....	II, 457	III, 581
739	Revolving Fire-Arm .....	II, 551	III, 633
740	Knitting-Machine .....	I, 604	III, 177
741	Railroad Car Axle Box .....	II, 185	III, 391
742	Cultivator .....	I, 365	III, 18
743	Sugar Mould Carriages .....	I, 697	III, 231
744	Regulator for Time-Keepers .....	II, 115	III, 346
745	Machine for Hulling and Cleaning Clover-Seed .....	I, 427	III, 59
746	Cigars .....	II, 597	III, 656
747	Staples for Blind-Slats .....	I, 575	III, 157
748	Paper File .....	II, 514	III, 614
749	Harvester .....	I, 393	III, 36
750	Lubricator for Railroad Axles .....	II, 270	III, 449
751	Opening and Closing Outside Blinds .....	I, 505	III, 111
752	Screw-Cutting Machine .....	I, 569	III, 153
753	Horse Hay-Rake .....	I, 470	III, 90
754	Manufacture of Soap .....	I, 695	III, 229
755	Folding Billiard Table .....	II, 593	.....
756	Compositions for Tanning Leather .....	I, 666	.....
757	Balance Steam Trap .....	II, 37	III, 291
758	Printing Press .....	II, 529	III, 623
759	Preventing Corrosion of the Binding Screws in Galvanic Batteries .....	II, 96	III, 332
760	Rotary Reciprocating Knives for Smoothing Staves .....	II, 371	III, 528
761	Self Loosening Horse and Cattle Tie .....	II, 604	III, 661
762	Axle Boxes .....	II, 183	III, 390
763	Car Wheel .....	II, 206	III, 408
764	Pneumatic Springs .....	II, 229	III, 421
765	Cane for Paying Omnibus Fares .....	II, 226	III, 420
766	Lighting Gas by Electricity .....	II, 92	III, 328
767	Machine for Testing the Strength of Car-Springs .....	II, 204	III, 407
768	Machine for Slicing Coal .....	I, 705	III, 234
769	Horse-Power Machine .....	II, 294	III, 467
770	Doll Heads .....	II, 502	.....
771	Apparatus for Manufacturing White Lead .....	I, 698	III, 231
772	Clothes-Dryer .....	II, 449	III, 576
773	Self-Waiting Table .....	II, 483	III, 596
774	Sawing-Mill .....	II, 358	III, 513
19, 775	Heating Apparatus .....	I, 721	III, 243

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19, 776	Railroad Car-Wheel .....	II, 206	III, 409
777	Gas-Generator .....	I, 676	III, 221
778	Composition for Coating Telegraph Wires .....	I, 665	.....
779	Straw-Cutter .....	I, 491	III, 105
780	Coffee and Tea Pot .....	II, 472	III, 589
781	Air-Heating Furnace .....	I, 709	III, 236
782	Churn .....	I, 347	I, 4
783	Combination of Lead Pencil and Eraser .....	II, 509	III, 610
784	Scissors-Sharpener .....	II, 479	III, 594
785	Diving-Bell .....	II, 57	III, 303
786	Lathe Chuck .....	I, 532	III, 128
787	Windlass .....	II, 84	III, 323
788	Washing-Machine .....	II, 488	III, 600
789	Ticket-Holders for Railroad Cars .....	II, 223	III, 418
790	Wrench .....	I, 582	III, 161
791	Desk-Seats for Schools .....	II, 601	III, 659
792	Brick-Machine .....	II, 381	III, 536
793	Sewing Machine .....	I, 625	III, 193
794	Railroad Car-Coupling .....	II, 194	III, 399
795	Railroad-Brakes .....	II, 120	III, 350
796	Stove .....	I, 746	III, 257
797	Castng Types for Printing .....	II, 528	III, 621
798	Pendulum-Power .....	II, 101	III, 336
799	Tubular Wrought-Iron Shafts .....	I, 530	III, 127
800	Machine for Shelling Peas .....	I, 433	III, 62
801	Cross-Cut Sawing Machine .....	II, 353	III, 509
802	Mastic Composition .....	I, 667	.....
803	Harvester .....	I, 333	III, 36
804	Tempering and Hardening Steel and Iron .....	I, 576	.....
805	Wood Screws .....	I, 569	III, 153
806	Rotary-Cutter for Tonguing and Grooving .....	II, 372	III, 528
807	Mill .....	II, 296	III, 468
808	Seed-Drill .....	I, 374	III, 22
809	Corn-Sheller .....	I, 360	III, 14
810	Railroad Car-Wheel .....	II, 208	III, 409
811	Press .....	II, 272	III, 449
812	Hoe .....	I, 427	III, 58
813	Steering Apparatus .....	II, 76	III, 317
814	Hand Exercises for Musicians .....	II, 512	III, 612
815	Permutation Lock .....	I, 542	III, 133
816	Machine for Burning Wool .....	I, 658	III, 214
817	Attaching Plumb-Line to Plumb and Level Indicator .....	II, 102	III, 337
818	Seed-Planter .....	I, 445	III, 73
819	Lightning-Conductors .....	II, 98	III, 334
820	Hub of Carriage-Wheel .....	II, 213	III, 412
821	Cotton-Press .....	II, 275	III, 453
822	Corn-Harvester .....	I, 409	III, 45
823	Sewing-Machine .....	I, 625	III, 194
824	Syrup Casters .....	II, 445	III, 573
825	Trap for Animals .....	II, 615	III, 666
826	Grinding-Mill .....	II, 304	III, 475
827	Apparatus for Roasting Coffee .....	II, 453	III, 579
828	Churn .....	I, 348	III, 5
829	Attaching Expansible Cutting-Lips to Augers .....	II, 345	III, 487
830	Clasps for Fastening Bags .....	II, 262	III, 443
831	Pen and Pencil Cases .....	II, 518	III, 616
832	Securing Pocket-Books .....	II, 609	III, 664
833	Hand Corn-Planter .....	I, 441	III, 68
834	Portable Pump .....	II, 252	III, 437
835	Saw-Gummer .....	I, 565	III, 150
19, 836	Hardening Iron and Steel .....	I, 528	.....

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19, 837	Refrigerator .....	II, 475	III, 591
838	Cotton-Press .....	II, 275	III, 453
839	Seeding-Machine .....	I, 476	III, 96
840	Box Cases and Lubricators for Railroad Car-Axles .....	II, 185	III, 391
841	Protecting Tiller-Ropes of Vessels from Fire .....	II, 79	III, 318
842	Pipe Tonge .....	I, 577	III, 159
843	Puddling Furnace .....	I, 561	III, 147
844	Bootjack and Burglars' Alarm combined .....	II, 432	III, 567
845	Lantern .....	I, 737	III, 251
846	Horse-Collar Blocks .....	II, 400	III, 549
847	Railroad-Station Indicator .....	II, 156	III, 372
848	Converting Reciprocating into Rotary Motion .....	II, 313	III, 480
849	Potato-Digger .....	I, 467	III, 58
850	Reefing Sails .....	II, 72	III, 313
851	Row-Lock .....	II, 71	III, 311
852	Coupling Pipes .....	I, 558	III, 146
853	Holding and Feeding the Bolt in Stave-Machines .....	II, 370	III, 528
854	Machine for Cutting Files .....	I, 519	III, 120
855	Ice Pitcher .....	II, 471	III, 589
856	Machine for Crimping Tobacco .....	II, 612	III, 665
857	Piano-Forte Action .....	II, 52	III, 618
858	Atmospheric-Pressure Dental Plates .....	II, 562	III, 639
859	Seeding-Machine .....	I, 475	III, 96
860	Smut-Machine .....	II, 321	III, 485
861	Visc-Anvil for Repairing T-Rails .....	I, 580	III, 160
862	Corn-Sheller .....	I, 360	III, 14
863	Fence Post .....	II, 137	III, 362
864	Harvester .....	I, 394	III, 36
865	Threshing-Machine .....	I, 497	.....
866	Coated Metals .....	I, 545	III, 136
867	Machine for Splitting Wood .....	II, 377	III, 532
868	Removable Rammer of Revolving Fire-Arm .....	II, 556	III, 635
869	Machine for Planting Potatoes .....	I, 452	III, 76
870	Saw-Mill .....	II, 354	III, 509
871	Seeding-Machine .....	I, 476	III, 96
872	Seeding-Machine .....	I, 476	III, 97
873	Field Fence .....	II, 133	III, 360
874	Cotton-Seed Planter .....	I, 439	III, 67
875	Wallet-Fastener .....	II, 617	III, 668
876	Sewing-Machine .....	I, 625	III, 194
877	Grain-Separator .....	I, 380	III, 27
878	Plough .....	I, 456	III, 80
879	Lock .....	I, 533	III, 128
880	Railroad Station Indicator .....	II, 156	III, 373
881	Hand-Printing Stamp .....	II, 537	III, 628
882	Carpet-Holder .....	II, 441	III, 572
883	Ironing-Table .....	II, 4-3	III, 596
884	Harvester .....	I, 393	III, 36
885	Lamp-Attachment .....	I, 727	III, 246
886	Plough .....	I, 456	III, 80
887	Coupling of Shafting for Propellers .....	II, 70	III, 311
888	Piston for Steam-Engines .....	II, 18	III, 279
889	Locomotive Engine .....	II, 25	III, 285
890	Grate for Steam-Engines .....	II, 18	III, 279
891	Door-Bolt .....	I, 505	III, 111
892	Machinery for Bolting, Dussing, and Separating .....	II, 285	I-I, 461
893	Guiding Reciprocating Scroll-Saws .....	II, 361	III, 515
894	Reaping and Mowing-Machine .....	I, 472	III, 93
895	Straw-Cutter .....	I, 492	III, 105
896	Lamp .....	I, 723	III, 244
19, 897	Lantern .....	I, 737	III, 251

No.	Invention or Discovery.	Text.	Plates.
19, 898	Lamp .....	I, 724	III, 245
899	Grain-Separator .....	I, 380	III, 27
900	Portable Gas Retort .....	I, 685	III, 226
901	Awls and Tools .....	I, 502	III, 110
902	Seeding-Machine .....	I, 476	III, 97
903	Sewing-Machine .....	I, 626	III, 194
904	Reaping and Mowing-Machine .....	I, 471	III, 93
905	Chaff-Screens for Winnowing-Machines .....	I, 500	III, 109
906	Sawing-Machine .....	II, 352	III, 508
907	Double-Acting Force-Pump .....	II, 252	III, 437
908	Dredging-Machine .....	II, 127	III, 356
909	Plough .....	I, 456	III, 80
910	Railroad Car-Seat .....	II, 198	III, 403
911	Washing-Machine .....	II, 498	III, 600
912	Turning the Edges of Circular Boot-Tops .....	II, 395	III, 545
913	Mowing-Machine .....	I, 431	III, 61
914	Truss-Pad .....	II, 567	III, 643
915	Corn-Sheller .....	I, 360	III, 14
916	Bases for Artificial Teeth .....	II, 566	.....
917	Railroad Car-Brake .....	II, 189	III, 393
918	Cop-Tubes .....	I, 512	III, 116
919	Harvester .....	I, 394	.....
920	Cutting Device for Harvesters .....	I, 413	III, 48
921	Hay Knives .....	I, 426	III, 58
922	Spring Bed-Bottom .....	II, 421	III, 561
923	Water and Fireproof Safe .....	I, 745	III, 256
924	Seed-Drill .....	I, 374	III, 22
925	Railroad Car-Coupling .....	II, 194	III, 399
926	Alarm-Lock .....	II, 586	III, 651
927	Chronometric-Lock .....	I, 539	III, 131
928	Wheelwright's Machine .....	II, 375	III, 531
929	Filterer .....	II, 238	III, 428
930	Machine for Excavating and Washing Gold .....	I, 520	III, 120
931	Bee-Hive .....	I, 343	III, 1
932	Bonnet-Frame .....	II, 564	III, 643
933	Throttle-Valve .....	II, 47	III, 297
934	Constructing Trunk Handles .....	II, 419	III, 559
935	Straw-Cutter .....	I, 492	III, 106
936	Track Clearer for Mowing-Machine .....	I, 433	III, 62
937	Door-Fastener .....	I, 512	III, 116
938	Grain and Grass Harvester .....	I, 415	III, 49
939	Machine for Hoisting and Dumping Coal .....	II, 266	III, 445
940	Bar for Securing Bank Vaults .....	I, 503	III, 111
941	Illuminating Iron Rolling Shutters .....	II, 170	III, 379
942	Furnace .....	I, 708	III, 236
943	Stencil-Pallet .....	II, 539	III, 628
944	Conduit Joint for Gas-Pipe .....	I, 559	III, 146
945	Connecting Rigidly the Ends of Metal Beams .....	I, 544	III, 133
946	Cords for Skirts .....	II, 579	.....
947	Giving Adhesion to Driving Wheels of Steam Vehicles, &c .....	II, 234	III, 425
948	Process of Extracting Fat Oil from Seeds .....	I, 691	.....
949	Fog-Bell .....	II, 57	III, 303
950	Snow-Plough .....	II, 172	III, 381
951	Tightening Spokes and Felloes of Carriage Wheels .....	II, 214	III, 413
952	Straw-Cutter .....	I, 492	III, 105
953	Seed-Planter .....	I, 446	III, 73
954	Wrench .....	I, 582	III, 162
55	Chain-Shackle .....	I, 511	III, 115
956	Cooking-Stove .....	I, 752	III, 260
19, 957	Horse-Shoe Machine .....	I, 526	III, 124

No.	Invention or Discovery.	Text.	Plates.
19, 958	Raking Attachment to Harvesters .....	I, 421	III, 56
959	Gas-Burner .....	I, 716	III, 240
960	Soda Fountains .....	I, 695	III, 230
961	Repeating Fire-Arm .....	II, 551	III, 633
962	Locomotive Engine .....	II, 26	III, 285
963	Rolling-Mill .....	I, 562	III, 148
964	Preserving-Jar .....	II, 462	III, 584
965	Oven .....	II, 470	III, 588
966	Watch-Case .....	II, 116	III, 347
967	Rotary Steam-Engine .....	II, 11	III, 273
968	Machine for Rolling and Cutting Dough .....	II, 456	III, 580
969	Steam Generator .....	II, 33	III, 289
970	Signs, Door-Plates, &c .....	II, 538	III, 628
971	Manufacturing Splints for Brooms .....	II, 434	III, 226
972	Watch-Case .....	II, 116	III, 347
973	Burglars' Alarm .....	II, 583	III, 650
974	Preparing Manure-Beds .....	I, 686	.....
975	Horse Hay-Rakes .....	I, 470	III, 91
976	Gearing for Horse-Power .....	II, 293	III, 467
977	Life-Boat .....	II, 69	III, 306
978	Dressing-Saws .....	II, 359	III, 514
979	Sewing-Machine .....	I, 626	III, 194
980	Runners of Sleds .....	II, 228	III, 420
981	Compound Air-Pump and Gasometer .....	II, 250	III, 435
982	Sharpening Device for Rotary Cutters .....	II, 333	III, 491
983	Cross-Cut Sawing-Machine .....	II, 354	III, 510
984	Cooling and Drying Meal .....	II, 295	III, 468
985	Platform Scales .....	II, 290	III, 457
986	Driving Wheel for Locomotive Engines .....	II, 27	III, 286
987	Portable Invalid Bedstead .....	II, 429	III, 564
988	Burnisher .....	I, 507	III, 113
989	Life-Preserving Bucket-Shaft .....	II, 61	III, 305
990	Field Fence .....	II, 133	III, 360
991	Treatment of Sulphuretted Ores .....	I, 698	.....
992	Rail for Street Railroads .....	II, 161	III, 375
993	Clenching Horse-Shoe Nails .....	I, 551	III, 140
994	Runners of Sleds .....	II, 227	III, 420
995	Steam-Governor .....	II, 24	III, 283
996	Centre Boards for Navigable Vessels .....	II, 80	III, 320
997	Operating Blacksmith's Hammer .....	I, 581	III, 192
998	Umbrella .....	II, 581	III, 649
999	Harvester .....	I, 394	III, 37
20, 010	Combined Coal Scuttle and Ash Sifter .....	I, 705	III, 234
1	Potato Planter .....	I, 442	III, 69
2	Domestic Mangle .....	II, 466	III, 566
3	Corn-Sheller .....	I, 361	III, 14
4	Securing Tires to Railroad Car Wheels .....	II, 208	III, 409
5	Portable Field Fence .....	II, 135	III, 361
6	Operating Sewing-Machines .....	I, 651	III, 210
7	Railroad Rail .....	II, 153	III, 372
8	Catch Latch for Farm Gates .....	II, 140	III, 364
9	Hollow Cast-Iron Cooking Utensils .....	I, 529	III, 127
10	Bit-Holder .....	II, 330	III, 490
11	Metallic Shoes for the Braces of Truss-Girders .....	II, 142	III, 365
12	Quartz-Mill .....	II, 308	III, 478
13	Curtain Fixture .....	II, 455	III, 580
14	Seed Planting Hoes .....	I, 451	III, 76
15	Lime-Kiln .....	II, 389	III, 542
16	Machine for Making Dowel Pins .....	II, 377	III, 533
17	Reaping-Machine .....	I, 473	III, 94
20, 018	Smoothing and Polishing Iron .....	II, 479	III, 594

No.	Invention or Discovery.	Text.	Plates.
20, 019	Meat-Cutter .....	II, 468	III, 587
20	Manufacture of Pasteboard .....	I, 617	.....
21	Ventilating Railroad Cars .....	II, 220	III, 416
22	Casting Car Wheels .....	I, 509	III, 113
23	Horse-Shoe Machine .....	I, 596	III, 123
24	Corn-Planter .....	I, 434	III, 63
25	Churn .....	I, 348	III, 5
26	Revolving Retorts for Distilling Coal, &c .....	I, 670	III, 217
27	Lock .....	I, 533	III, 128
28	Inkstand .....	II, 508	III, 610
29	Mill-Stone Dress .....	II, 309	III, 478
30	Rice-Huller .....	I, 427	III, 59
31	Furniture Casters .....	II, 460	III, 583
32	Apparatus for Beating Eggs, Churning, &c .....	II, 458	III, 581
33	Attaching Shafts to Vehicles .....	II, 229	III, 421
34	Apparatus for Evaporating Brine .....	I, 672	III, 219
35	Mowing-Machine .....	I, 431	III, 62
36	Machine for Cutting Screws .....	I, 570	III, 153
37	Device for Turning Down the Edges of Elastic Cloth .....	I, 567	III, 164
38	Straw and Stalk Cutters .....	I, 490	III, 104
39	Card Printing Press .....	II, 536	III, 627
40	Frog for Railroad Crossings .....	II, 152	III, 371
41	Breech Loading Fire-Arm .....	II, 546	III, 630
42	Rat Trap .....	II, 616	III, 667
43	Machine for Making Washers .....	I, 581	III, 160
44	Loom .....	I, 608	III, 179
45	Blowing Apparatus .....	II, 236	III, 426
46	Constructing Joints .....	II, 106	III, 339
47	Sulphuret of Carbon .....	I, 663	III, 216
48	Processes for Extracting Fatty Matters .....	I, 691	III, 228
49	Cotton Seed Planter .....	I, 439	III, 67
50	Harvester .....	I, 395	III, 37
51	Cotton-Gin .....	I, 596	III, 171
52	Hatchet .....	I, 522	III, 122
53	Tuyere .....	I, 579	III, 159
54	Cabbage-Cutter .....	II, 437	III, 570
55	Ruler .....	II, 609	III, 664
56	Pencil-Sharpener .....	II, 519	III, 617
57	Buffer-Head for Railroad Coupling .....	II, 151	III, 371
58	Liquids for Gas Meters .....	I, 680	.....
59	Roofing Tile .....	II, 169	III, 379
60	Pump-Coupling .....	II, 252	III, 436
61	Raking Attachment for Harvester .....	I, 420	III, 55
62	Churn .....	I, 348	III, 5
63	Lock for Doors .....	I, 541	III, 133
64	Combination Cooking Range and Gas Generator .....	I, 741	III, 254
65	Pen Cleaner and Holder .....	II, 518	III, 616
66	Cotton-Harvester .....	I, 412	III, 48
67	Corn-Harvester .....	I, 410	III, 46
68	Steam Warming Apparatus .....	I, 760	III, 265
69	Hose-Supporters .....	II, 572	III, 646
70	Elliptic Cushion for Railroad Cars .....	II, 220	III, 416
71	Field Fence .....	II, 133	III, 361
72	Life and Treasure Buoy .....	II, 59	III, 304
73	Breech-Loading Fire-Arm .....	II, 546	III, 631
74	Corn Planter .....	I, 435	III, 64
75	Toy .....	II, 613	III, 665
76	Spike-Machine .....	I, 574	III, 157
77	Machine for Wetting Paper .....	II, 517	III, 615
78	Protecting Gliding on Glass .....	II, 506	III, 609
20, 079	Machine for Making Horse-Shoes .....	I, 527	III, 126

No.	Invention or Discovery.	Text.	Plates.
20, 080	Harvester .....	I, 395	III, 37
81	Preparing Stereotype Plates .....	II, 540	III, 623
82	Metallic Shoe for Truss Bridges .....	II, 123	III, 352
83	Millstone Dress .....	II, 309	III, 478
84	Millstone Dress .....	II, 309	III, 478
85	Metal Awning .....	II, 588	III, 653
86	Cotton-Gin .....	I, 596	III, 172
87	Envelopes for Letters, &c. ....	II, 504	III, 608
88	Convertible Extension Table .....	II, 481	III, 595
89	Churn .....	I, 348	III, 5
90	Printing Press .....	II, 530	III, 623
91	Fly-Trap .....	II, 614	III, 666
92	Bedstead Rail .....	II, 430	III, 564
93	Apparatus for Raising Leather from Vats .....	II, 407	III, 553
94	Steam-Valve .....	II, 45	III, 295
95	Constructing Coffins .....	II, 598	III, 657
96	Paddle-Wheel .....	II, 64	III, 308
97	Bedstead .....	II, 425	III, 562
98	Leather-Sticker .....	II, 409	III, 554
99	Washing-Machine .....	II, 489	III, 601
100	Draw for Closets, Bureaus, &c. ....	II, 602	III, 659
101	Washing-Machine .....	II, 489	III, 600
102	Mill for Grinding Paint .....	II, 300	III, 471
103	Straw-Cutter .....	I, 492	III, 108
104	Smut and Grain-Cleaning Machine .....	II, 321	III, 485
105	Frame or Caisson of Breakwater, &c. ....	II, 121	III, 351
106	Warm-Air Register or Ventilator .....	I, 743	III, 255
107	Brick-Machine .....	II, 381	III, 536
108	Supplying Tenders with Water at Railroad-Stations .....	II, 157	III, 373
109	Brick-Machine .....	II, 381	III, 536
110	Apparatus for Generating Carbonic Acid Gas .....	I, 676	III, 221
111	Apparatus for Damping Paper .....	II, 513	III, 614
112	Folding-Mattress .....	II, 466	III, 586
113	Machine for Washing Bottles .....	II, 595	III, 656
114	Fire-Box of Locomotive-Engine Boilers .....	II, 26	III, 285
115	Fire-Box of Locomotive-Boilers .....	II, 25	III, 284
116	Boiler for Locomotive-Engines .....	II, 26	III, 285
117	Furnace of Locomotive-Boilers .....	II, 25	III, 285
118	Metallic Nuts .....	I, 546	III, 137
119	Raking and Delivering Attachment to Harvesters .....	I, 419	III, 53
120	Cotton-Gin .....	I, 596	III, 171
121	Corn and Cob-Mill .....	II, 298	III, 469
122	Gang Plough .....	I, 463	III, 84
123	Washing Machine .....	II, 489	III, 501
124	Sugar-Mill .....	II, 311	III, 479
125	Fishing Net .....	II, 608	III, 663
126	Nail-Machine .....	I, 548	III, 138
127	Adjustable-Seats for Vehicles .....	II, 229	III, 421
128	Bending Mould-Boards for Ploughs .....	I, 504	III, 111
129	Continuous Priming for Fire-Arms .....	II, 549	III, 632
130	Gas-Metres .....	I, 679	III, 222
131	Ship's Capetan .....	II, 74	III, 315
132	Syphonic Radiator .....	I, 741	III, 254
133	Ovens for Cooking-Stoves .....	I, 756	III, 263
134	Lamp .....	I, 724	III, 245
135	Sheltering from Dust the Lower Carrying-Pulley of Band-Saws .....	II, 359	III, 514
136	Steam-Engine .....	II, 12	III, 273
137	Machine for Bending Wood .....	II, 376	III, 533
138	Machine for Hulling Rice .....	I, 429	III, 60
139	Railroad Car-Coupling .....	II, 194	III, 400
20, 140	[Suspended, and issued as No. 21,173] .....		



No.	Invention or Discovery	Text.	Plates.
20, 141	Machine for Making Horse shoe Nails.....	I, 551	III, 141
142	Water-Closet.....	II, 124	III, 353
143	Seed-Planter.....	I, 446	III, 73
144	Revolving Fire-Arm.....	II, 552	III, 633
145	Nat-Machine.....	I, 554	III, 143
146	Brick-Kiln.....	II, 379	III, 534
147	Feeding Device for Cross-Cut Sawing.....	II, 350	III, 505
148	Railroad Car-Spring.....	II, 245	III, 407
149	Ring-Bolt.....	I, 506	III, 112
150	Governing Lateral Motion of Carriage in gigging back.....	II, 367	III, 512
151	Castng Car-Wheels.....	I, 509	III, 114
152	Harvester.....	I, 395	III, 37
153	Vapor-Lamp Burner.....	I, 730	III, 243
154	Washing-Machine.....	II, 489	III, 601
155	Braces of Eave-Troughs.....	II, 120	III, 359
156	Billiard-Table Cushions.....	II, 592	III, 654
157	Quartz-Crushers.....	I, 562	III, 149
158	Seed-Planter.....	I, 446	III, 73
159	Lamp.....	I, 724	III, 245
160	Revolving Fire-Arm.....	II, 552	III, 633
161	Smut-Mill.....	II, 308	III, 478
162	Seeding-Machine.....	I, 477	III, 97
163	Corn-Husker.....	I, 356	III, 10
164	Mowing-Machine.....	I, 431	III, 62
165	Punching Metallic Tubes.....	I, 547	III, 137
166	Automatic Lathe.....	II, 333	III, 495
167	Steam Boiler.....	II, 1	III, 266
168	Chuck for Screw Cutting.....	I, 568	III, 152
169	Fluid Metre.....	II, 245	III, 432
170	Holsting-Machine.....	II, 267	III, 445
171	Cast-Iron Pipe.....	I, 558	III, 146
172	Arrangement of Gas Engines.....	II, 9	III, 270
173	Cement for Roofing.....	II, 168	.....
174	Checking the Feed in Shingle-Machines.....	II, 364	III, 522
175	Sewing-Machine.....	I, 627	III, 194
176	Ventilating and Excluding Dust from Railroad Cars.....	II, 221	III, 416
177	Gas Generator.....	I, 677	III, 221
178	Lamp Attachment for Preventing Smoke.....	I, 727	III, 246
179	Tympana for Printing Presses.....	II, 537	III, 627
180	Harvester.....	I, 396	III, 37
181	Harvester.....	I, 396	III, 37
182	Harvester.....	I, 397	III, 38
183	Sheet Metal Chains.....	II, 501	III, 607
184	Sawing-Machine.....	II, 352	III, 508
185	Boat-Tree.....	II, 395	III, 546
186	Self-Regulating Grain Measurer.....	II, 99	III, 335
187	Water-Wheel.....	II, 257	III, 440
188	[Suspended].....	.....	.....
189	Churn.....	I, 348	III, 5
190	Dressing and Sizing Warps.....	I, 657	III, 214
191	Harvester.....	I, 398	III, 39
192	Seating the Movable Cutter in Expansive Bits.....	II, 331	III, 490
193	Corn Planter.....	I, 435	III, 64
194	Fasteners for Sleeve Buttons.....	II, 571	III, 644
195	Harrow.....	I, 384	III, 29
196	Grain-Cleaning Machine.....	I, 377	III, 25
197	Hub-Machine.....	II, 224	III, 419
198	Reclining Chair.....	II, 446	III, 574
199	Pipes and Cigar Holders.....	II, 613	III, 665
200	Water-Wheel.....	II, 258	III, 440
20, 201	Time-Keeper.....	II, 113	III, 345

No.	Invention or Discovery	Text.	Plates.
20, 202	Bee-Hive.....	I, 343	III, 1
203	Preserve Can.....	II, 438	III, 570
204	Printing Press.....	II, 530	III, 623
205	Paint Compounds.....	I, 688	.....
206	Sofa Bedstead.....	II, 430	III, 565
207	Cultivator.....	I, 366	III, 18
208	Corn Mill.....	II, 298	III, 469
209	Can for Preserving Food.....	II, 438	III, 570
210	[Cancelled].....	.....	.....
211	Wrench.....	I, 582	III, 162
212	Reaping and Mowing-Machine.....	I, 472	III, 93
213	Compound Photograph.....	II, 522	.....
214	Cartridge Case.....	II, 545	III, 630
215	Binding Device for Harvester.....	I, 409	III, 44
216	Cotton Gin.....	I, 597	III, 172
217	Self-Inking Hand Stamps.....	II, 539	III, 628
218	Implement for Shooting Missiles at Cows, &c., on Railroads.....	II, 160	III, 375
219	Implement for Sharpening Slate Pencils.....	II, 520	III, 617
220	Cider Mill.....	II, 297	III, 469
221	Harvester.....	I, 397	III, 38
222	Harness Tug Buckle.....	II, 405	III, 552
223	Corn-Huskers.....	I, 356	III, 10
224	Straw-Cutter.....	I, 492	III, 106
225	Harvester.....	I, 397	III, 38
226	Brush.....	II, 434	III, 567
227	Harvester.....	I, 397	III, 38
228	Lasts.....	II, 406	III, 552
229	Repeating Ordnance.....	II, 559	III, 638
230	Washing-Machine.....	II, 490	III, 601
231	Ironing Table.....	II, 483	III, 596
232	Burner for Vapor Lamps.....	I, 723	III, 247
233	Working Ship's Lower Sails in Courses.....	II, 75	III, 316
234	Water-Wheel.....	II, 257	III, 440
235	Fly-Net.....	II, 608	III, 663
236	Metallic Rolling Shutters.....	II, 171	III, 380
237	Railroad Car-Brake.....	II, 189	III, 395
238	Nash-Fastener.....	I, 515	III, 118
239	Steering Apparatus.....	II, 77	III, 317
240	Candy-Machine.....	II, 525	III, 656
241	Forks for Elevating Hay.....	I, 426	III, 58
242	Utilizing Waste Vulcanized Rubber.....	I, 694	.....
243	Finger or Guard for Harvesters.....	I, 414	III, 48
244	Washing-Machine.....	II, 490	III, 601
245	Guides for Sewing-Machines.....	I, 650	III, 209
246	Fastening for Hame Tugs.....	II, 402	III, 550
247	Opening and Closing Farm Gates.....	II, 140	III, 364
248	Fastening Railroad Rails.....	II, 161	III, 376
249	Machinery for Hulling and Threshing Clover.....	I, 428	III, 59
250	Shot.....	II, 561	III, 638
251	Reaping and Mowing Machine.....	I, 472	III, 93
252	Escapement for Time Keepers.....	II, 113	III, 346
253	Corn-Husker.....	I, 356	III, 10
254	Railroad Car for Day and Night Service.....	II, 220	III, 416
255	Electric Lamp.....	I, 732	III, 249
256	Ballot-Boxes.....	II, 529	III, 653
257	Horse-Power.....	II, 292	III, 466
258	Meat-Chopper.....	II, 467	III, 587
259	Card Plate for Trunks.....	II, 420	III, 559
260	Cultivator.....	I, 366	I, 19
261	Barrel-Head Machine.....	II, 325	III, 487
20, 262	Pencil Sharpeners.....	II, 519	III, 616

No.	Invention or Discovery.	Text.	Plates.
20, 263	Woven Tucked Fabrics.....	I, 591	III, 166
264	Railroad Car-Coupling.....	II, 195	III, 400
265	Cooking Stove.....	I, 752	III, 260
266	Corn-Shellor.....	I, 361	III, 14
267	Thick Woven Fabrics.....	I, 591	III, 166
268	Forming the Heads of Carriage Springs.....	II, 212	III, 411
269	Plough.....	I, 466	III, 80
270	Machine for Cleaning Cotton.....	I, 591	III, 166
271	Harvester.....	I, 398	III, 38
272	Harvester.....	I, 399	III, 39
273	Sign.....	II, 538	III, 628
274	Stove.....	I, 746	.....
275	Reaping and Mowing Machine.....	I, 472	III, 93
276	Press for Zincographic Printing.....	II, 526	III, 630
277	Grinding and Sizing Paper Pulp.....	I, 615	III, 184
278	Hame Tug Fastener.....	II, 402	III, 550
279	Horse Power.....	II, 291	III, 466
281	Safety Drop for Keys.....	I, 531	III, 127
281	Block for Repairing T-Rails.....	II, 162	III, 376
282	Toothed Cylinder for Grinding.....	II, 291	III, 466
283	Vapor Lamp.....	I, 735	III, 250
284	Spring Rocking Cradle.....	II, 454	III, 579
285	Applying Cop Tubes to Spindles.....	I, 654	III, 212
286	Tile-Machine.....	I, 518	III, 119
287	Worming, Parcelling, and Servicing the Rigging of Vessel.....	II, 83	III, 322
288	Mill for Treating Chinese Sugar Cane.....	II, 302	III, 472
289	Aero-Vapor Burners for Lamps.....	I, 727	III, 246
290	Chasing Mill.....	II, 312	III, 480
291	Manufacture of Metallic Zinc.....	I, 544	III, 162
292	Feeding the Bolt in Lath-Machines.....	II, 337	III, 494
293	Safety Attachment for Railroad Cars.....	II, 222	III, 417
294	Preparation of Fibre for Paper Pulp.....	I, 616	III, 184
295	Device for Slicing Apples.....	II, 421	III, 560
296	Burner for Vapor Lamps.....	I, 729	III, 247
297	Com-Planter.....	I, 435	III, 64
298	Lathe Dog.....	II, 338	III, 495
299	Artificial Whalebone.....	II, 617	.....
300	Apparatus for Cleaning the Coulters of Ploughs.....	I, 466	III, 88
301	Seeding-Machine.....	I, 477	III, 97
302	Self-Lighting and Extinguishing Lanterns.....	I, 738	III, 252
303	Street-Sweeping Machine.....	II, 611	III, 664
304	Apparatus for Baking and Cooking.....	I, 700	III, 232
305	Regulating by Electricity the Issues of Gas from Burners.....	I, 701	III, 232
306	Machine for Affixing Office Stamps to Letters.....	II, 611	III, 664
307	Bootjack.....	II, 432	III, 565
308	Moulding Frame for the Construction of Boats.....	II, 55	III, 302
309	Tips for Fishing Rods.....	II, 604	III, 660
310	Grinding Mill.....	II, 305	III, 475
311	Securing Metallic Bands on Cotton Bales.....	II, 264	III, 443
312	Nail-Machine.....	I, 549	III, 139
313	Marking Device Attached to Hand Saws.....	II, 360	III, 515
314	Valve Cock.....	II, 236	III, 427
315	Breech-Loading Rifle.....	II, 560	III, 638
316	Furnace Grates.....	I, 713	III, 239
317	[Cancelled and subsequently issued as No. 20, 929].	.....	.....
318	Driving Wheels for Portable Steam Engines, &c.....	II, 324	III, 466
319	Steam Boiler.....	II, 2	III, 266
320	Composition for Varnishing Leather.....	I, 666	.....
321	Sounding Apparatus.....	II, 75	III, 316
322	Machine for Hoisting Ice.....	, 05	III, 662
20, 323	Lathe.....	II, 337	III, 495

No.	Invention or Discovery.	Text.	Plates.
20,324	Vapor Lamp Burner.....	I, 731	III, 248
325	Harrow.....	I, 384	III, 29
326	Actuating the Index of Hydrometers.....	II, 97	III, 333
327	Hominy Mill.....	II, 307	III, 476
328	Reciprocating Paddle.....	II, 64	III, 307
329	Flouring Mill.....	II, 299	III, 469
330	Machine for Grinding Saws.....	I, 562	III, 151
331	Labricating Car Axles.....	II, 269	III, 448
332	Valve Propeller.....	II, 69	III, 311
333	Burglars' Alarm Lock.....	II, 586	III, 652
334	Harvester.....	I, 399	III, 39
335	Water-Wheel.....	II, 258	III, 440
336	Wind-Wheel.....	II, 261	III, 442
337	Levelling Device Attached to Hand Saws.....	II, 300	III, 515
338	Window-Spring.....	I, 575	III, 157
339	Railroad Car-Brake.....	II, 189	III, 396
340	Knife Polisher.....	II, 404	III, 585
341	Carpet Fastener.....	II, 441	III, 571
342	Gang Plough.....	I, 463	III, 85
343	Apparatus for Catching Fish.....	II, 603	III, 660
344	Machine for Turning Irregular Forms.....	II, 374	III, 530
345	Cutter-Head and Rest for Cutting Irregular Forms.....	II, 335	III, 492
346	Cheese Press.....	II, 272	III, 450
347	Manufacture of Dextrin and Sugar.....	I, 697	.....
348	Thermostat.....	II, 112	III, 345
349	Omnibus Register.....	II, 220	III, 419
350	Wind Wheel.....	II, 261	III, 442
351	Separating Combustible from Incombustible Gases in Furnaces, &c.....	I, 716	III, 240
352	Iron Gate and Fence Post.....	II, 147	III, 368
353	Production of Electrottype Plates.....	I, 691	.....
354	Marine Alarm and Fog Signal.....	II, 63	.....
355	Preparing Paper Pulp from Reeds.....	I, 615	III, 184
356	Protractor.....	II, 102	III, 337
357	Seeding-Machine.....	I, 477	III, 97
358	Seeding-Machine.....	I, 477	III, 97
359	Foot Cleaner.....	II, 458	III, 581
360	Corn-Husker.....	I, 367	III, 10
361	Straw-Cutter.....	I, 493	III, 106
362	Bed Bottom.....	II, 422	III, 560
363	Journal Box.....	II, 225	III, 419
364	Clothes-Pin.....	II, 452	III, 578
365	Washing-Machine.....	II, 491	III, 601
366	Seeding-Machine.....	I, 477	III, 98
367	Railroad-Switch.....	II, 174	III, 382
368	Governor for Horse Power.....	II, 294	III, 467
369	Washing-Machine.....	II, 491	III, 601
370	Flouring-Mill.....	II, 299	III, 471
371	Apparatus for Distilling Spirit of Turpentine.....	I, 671	III, 217
372	Lifting Jacks.....	II, 267	III, 446
373	Lamp for Burning Coal Oil.....	I, 733	III, 249
374	Life Boat.....	II, 60	III, 305
375	Gas Retort.....	I, 683	III, 225
376	Rocking Chair and Cradle.....	II, 445	III, 574
377	Seed Drill.....	I, 374	III, 23
378	Raking Attachment to Harvesters.....	I, 421	III, 56
379	Wrench.....	I, 563	III, 162
380	Feed Regulator for Steam Boilers.....	II, 5	III, 268
381	Attachment for Opening and Closing Doors.....	I, 533	III, 1
382	Portable Soda-Water Apparatus.....	I, 695	III, 229
383	Composition for Artificial Leather.....	I, 665	.....
20,384	Changing Rotary into Reciprocating Motion.....	II, 313	III, 480

No.	Invention or Discovery.	Text.	Plates.
20, 385	Power and Head Drill.....	I, 514	III, 117
386	Vapor Lamp.....	I, 735	III, 250
387	Machine for Cutting Pipe.....	I, 559	III, 146
388	Steam Trap Valve.....	II, 47	III, 297
389	Stove.....	I, 746	III, 257
390	Extracting Teeth.....	II, 567	III, 642
391	Knife-Cleaner.....	II, 463	III, 586
392	Railroad Car-Coupling.....	II, 195	III, 401
393	Rotary Last-Holder.....	II, 406	III, 553
394	Harvester.....	I, 399	III, 39
395	Casting Faucets.....	I, 509	III, 114
396	Railroad-Brake.....	II, 120	III, 351
397	Musical Instrument.....	II, 510	III, 612
398	Telephonic Indicator for Steam-Bollers.....	II, 8	III, 269
399	Machine for Elevating, Measuring, and Bagging Grain.....	II, 290	III, 465
400	Lattice Iron Fence.....	II, 135	III, 362
401	Plate Holder for Photographic Cameras.....	II, 521	III, 617
402	Mechanism for Operating Semaphoric Signals.....	II, 105	III, 339
403	Attachment to ascertain time without looking at the watch.....	II, 118	III, 348
404	Mantel Bar.....	I, 738	III, 252
405	Sash-Fastener.....	I, 516	III, 118
406	Lubricating Car-Axles.....	II, 269	III, 448
407	Pipe-Tongs.....	I, 560	III, 146
408	Washing-Machine.....	II, 491	III, 601
409	Sewing Needles.....	I, 652	III, 210
410	Harrow.....	I, 3-5	III, 29
411	Raking Attachment to Harvester.....	I, 422	III, 56
412	Carriage-Brake.....	II, 219	III, 409
413	Sewing-Machine.....	I, 627	III, 195
414	Bridge.....	II, 121	III, 351
415	Wood-Burning Stove.....	I, 758	III, 264
416	Harvester.....	I, 399	III, 39
417	Bee-Hive.....	I, 344	III, 1
418	Springs for Railroad-Cars.....	II, 223	III, 417
419	Compound Railroad Axle.....	II, 148	III, 369
420	Smut-Machine.....	II, 321	III, 485
421	Horse-Power.....	II, 292	III, 466
422	Machine for Cleaning Grain.....	II, 269	III, 464
423	Steam-Valves.....	II, 45	III, 296
424	Shoulder-Brace Suspender.....	II, 5-10	III, 649
425	Grain-Cleaning Machine.....	I, 377	III, 25
426	Buoyant Life-Preserving State-Rooms.....	II, 80	III, 319
427	Windlass.....	II, 84	III, 323
428	Combined Wash-Stand and Night-Stool.....	II, 485	III, 597
429	Railroad Car-Brake.....	II, 190	III, 396
430	Cooking-Stove.....	I, 753	III, 261
431	Signal Lantern.....	II, 104	III, 339
432	Cotton-Seed Planter.....	I, 439	III, 67
433	Brick.....	II, 385	III, 539
434	Adjusting and Vibrating Back-Band Strap.....	II, 393	III, 545
435	Bedstead.....	II, 425	III, 562
436	Hinge for Daguerreotype and other Cases.....	II, 501	III, 607
437	Horizontal Water-Wheel.....	II, 261	III, 442
438	Gas Apparatus.....	I, 673	III, 220
439	Straw and Wood Over-Shoes.....	II, 412	III, 556
440	Seed-Planter.....	I, 446	III, 73
441	Machine for Making Horse-Shoes.....	I, 528	III, 126
442	Pump.....	II, 218	III, 434
443	Pump-Bucket.....	II, 251	III, 436
444	Truss-Pad.....	II, 568	III, 643
445	Smoother-Iron.....	II, 480	III, 594
20, 446	Lathe for Turning Metal Shafting.....	I, 546	III, 136

No.	Invention or Discovery.	Text.	Plates.
20, 447	Whitewash Brush .....	II, 435	III, 568
448	Gas-Retort .....	I, 683	III, 225
449	Threshing-Machine .....	I, 497	III, 108
450	Cooking-Stove .....	I, 752	III, 260
451	Spittoon .....	II, 480	III, 595
452	Rollers for Railway Bars .....	II, 163	III, 377
453	Manufacture of Gas .....	I, 678	III, 222
454	Hot-Air Furnace .....	I, 714	III, 239
455	Machinery for Hoisting and Lowering Goods .....	II, 266	III, 445
456	Water-Wheel .....	II, 258	III, 440
457	Harvester .....	I, 400	III, 39
458	Machine for Working Marble .....	II, 369	III, 542
459	Spoke-Shave .....	II, 367	III, 525
460	Pliers .....	I, 560	III, 147
461	Horse-Power .....	II, 292	III, 466
462	Mill-Stone Dress .....	II, 309	III, 478
463	Wooden Saddle-Trees for Harness-Saddles .....	II, 404	III, 551
464	Railroad-Chair .....	II, 150	III, 370
465	Apparatus for Distilling Turpentine .....	I, 671	III, 218
466	Stove .....	I, 746	III, 257
467	Corn-Planter .....	I, 435	III, 64
468	Railroad Car-Brake .....	II, 190	III, 396
469	Drill for Gas-Pipe .....	I, 513	III, 117
470	Machine for Wringing Clothes .....	II, 452	III, 578
471	Sewing-Machine .....	I, 627	III, 195
472	Railroad Chair .....	II, 149	III, 370
473	Washboard .....	II, 484	III, 597
474	Machine for Measuring, Registering, and Receiving Grain .....	I, 498	III, 109
475	Raking-Attachment to Harvester .....	I, 422	III, 56
476	Lock .....	I, 534	III, 128
477	Supplying Water to Steam-Boilers .....	II, 4	III, 267
478	Bedstead-Fastenings .....	II, 428	III, 563
479	Mowing-Machine .....	I, 432	III, 62
480	Attaching Ornaments to the Ear .....	II, 512	III, 613
481	Sewing-Machine .....	I, 628	III, 195
482	Washing-Machine .....	II, 491	III, 602
483	[Suspended] .....		
484	Admitting Light and Air through Steps, &c. ....	II, 172	III, 381
485	Preserve-Can .....	II, 439	III, 570
486	Bed-Bottom .....	II, 422	III, 560
487	Writing-Desk .....	II, 601	III, 659
488	Apparatus for Manufacture of Beer .....	I, 661	III, 215
489	Extension-Table .....	II, 4-2	III, 595
490	Machine for Grinding and Cutting .....	II, 291	III, 465
491	Stop-Watch .....	II, 118	III, 348
492	Platform-Scales .....	II, 280	III, 457
493	Bench-Plane .....	II, 343	III, 500
494	Machine for Cutting Out Stumps .....	II, 173	III, 382
495	Attaching the Bits to the Brace .....	II, 331	III, 490
496	Revolving Fire-Arm .....	II, 552	III, 634
497	Carriage-Spring .....	II, 211	III, 410
498	Burner for Vapor-Lamps .....	I, 729	III, 247
499	Refrigerating-Pitcher .....	II, 472	III, 589
500	Piano-Forte Action .....	II, 523	III, 618
501	Obtaining the Taper in Shingle-Machines .....	II, 365	III, 523
502	Tanning .....	II, 418	
503	Breech-Loading Fire-Arm .....	II, 546	III, 631
504	Brake for Wagons, &c. ....	II, 234	III, 425
505	Machine for Cutting Irregular Forms .....	II, 335	III, 493
506	Instrument for Taking the Sun's Altitude .....	II, 86	III, 324
20, 507	Combined Umbrella and Head-Rest .....	II, 224	III, 418

No.	Invention or Discovery.	Text.	Plates.
20, 508	Bee-Hive.....	I, 344	III, 1
509	Ratchet-Press.....	II, 278	III, 455
510	Revolving-Heels of Boots and Shoes.....	II, 399	III, 548
511	Excavating-Machine.....	II, 130	III, 358
512	Ink-Roller.....	II, 507	.....
513	Automatic Grain-Weighing Machine.....	II, 252	III, 460
514	Steam-Power Meter.....	II, 35	III, 290
515	Harvesting-Machine.....	I, 424	III, 57
516	Punching-Machine.....	I, 561	III, 147
517	Provision-Cutter.....	II, 473	III, 590
518	Bedstead.....	II, 425	III, 562
519	Tailors' Pressing-Machine.....	II, 580	III, 649
520	Metallic-Cap for Bottles.....	II, 595	III, 656
521	Smut-Machine.....	II, 322	III, 466
522	Grain-Separator.....	I, 380	III, 27
523	Hydraulic-Ram.....	II, 244	III, 431
524	Door-Lock.....	I, 540	III, 132
525	Reaping-Machine.....	I, 400	III, 39
526	Sash-Fastener.....	I, 516	III, 118
527	Planing-Machine.....	II, 346	III, 502
528	Supporting and Adjusting Gravers for Engraving-Machines.....	II, 504	III, 608
529	Machine for Finishing Soldered Tubing.....	I, 579	III, 159
530	Extension-Table.....	II, 481	III, 586
531	Sewing-Machine.....	I, 628	III, 195
532	Hose-Coupling.....	II, 239	III, 429
533	Applying the Power of the Steam Engine.....	II, 13	III, 274
534	Apparatus for Manufacturing Gas.....	I, 674	III, 220
535	Disconnecting Car-Axle Boxes from Pedestals.....	II, 185	III, 390
536	Brick Machine.....	II, 332	III, 537
537	[Suspended].....	.....	.....
538	House-Bell.....	II, 461	III, 784
539	Machine for Cutting Glaziers' Pins.....	II, 604	III, 661
540	Machine for Gathering the Toll in Grist-Mills.....	II, 312	III, 480
541	Apparatus for Manufacturing Gas.....	I, 675	III, 220
542	Machine for Crushing Stone.....	II, 391	III, 543
543	Quitting-Frame.....	II, 473	III, 590
544	Sash-Holder.....	I, 564	III, 149
545	Operating Churn.....	I, 363	III, 7
546	Heating Rotary-Boilers.....	I, 700	III, 232
547	Seeding-Machine.....	I, 478	III, 98
548	Pocket-Supporter for Billiard-Tables.....	II, 593	III, 655
549	Lime Kiln.....	II, 389	III, 542
550	Attachment of Pipes to Water-Closet Basins.....	II, 422	III, 560
551	Hay and Cotton-Press.....	II, 277	III, 454
552	Machine for Hulling Rice.....	I, 429	III, 55
553	Device in Feed-Motion of Shingle-Machines.....	II, 365	III, 507
554	Watch-Case.....	II, 117	III, 347
555	Windlass.....	II, 84	III, 322
556	Hand Printing-Press.....	II, 536	III, 627
557	Sewing-Machine.....	I, 624	III, 195
558	Manufacture of Burning Fluids.....	I, 702	.....
559	Reducing Wheel-Tires.....	I, 577	III, 158
560	Field-Fence.....	II, 133	III, 361
561	Skirt-Hoops.....	II, 575	III, 647
562	Apparatus for Distilling Oils.....	I, 670	III, 217
563	Post and Pile-Driver.....	II, 129	I.I, 357
564	Round Belting.....	II, 285	III, 460
565	Tanning Leather.....	II, 418	.....
566	Adjustable Hanger for Shafting.....	II, 319	III, 484
567	Retort for Generating Gas.....	I, 684	III, 226
20, 568	Corn-Husker.....	I, 357	.....

No.	Invention or Discovery.	Text.	Plates.
20, 569	Ivory Frame Composition .....	I, 667	.....
570	Fastening for Double Door .....	I, 513	III, 116
571	Door-Lock .....	I, 541	III, 133
572	Cotton-Seed Planter .....	I, 439	III, 67
573	Lamp for Lighting Gas .....	I, 733	III, 249
574	Washing-Machine .....	II, 491	III, 602
575	Seeding-Machine .....	I, 478	III, 98
576	Metallic Window-Blind .....	II, 179	III, 387
577	Cracker-Machine .....	II, 453	III, 579
578	Apparatus for Raising Sunken Vessels .....	II, 82	III, 321
579	Clothes-Frame .....	II, 450	III, 577
580	Invalid Bedstead .....	II, 429	III, 564
581	Machine for Cleaning Grain .....	I, 378	III, 25
582	Straw-Cutter .....	I, 493	III, 106
583	Car-Wheel .....	II, 216	III, 408
584	Gas-Burner .....	I, 717	III, 241
585	Device for Holding Sheep while being Sheared .....	I, 487	III, 103
586	Metallic Hub for Carriage-Wheel .....	II, 214	III, 412
587	Retorts for Distilling Oils from Coal .....	I, 671	III, 217
588	Construction of Harness-Pads .....	II, 403	III, 551
589	Light-Reflector .....	I, 743	III, 255
590	Weather-Strip for Doors .....	II, 126	III, 355
591	Furnace for Burning Bagasse .....	I, 710	III, 237
592	Ice-Pitcher .....	II, 471	III, 589
593	Harvester .....	I, 401	III, 40
594	Brick-Machine .....	II, 322	III, 536
595	Piano-Forte Action .....	II, 524	III, 619
596	Locomotive Signals .....	II, 28	III, 286
597	Gun-Carriage .....	II, 556	III, 636
598	Clasp for Skirt Hoops .....	II, 576	III, 647
599	Field Fence .....	II, 133	III, 360
600	Harvester .....	I, 400	III, 40
601	Hulling Stone Dress .....	II, 288	III, 463
602	Machine for Sizing Hat Bodies .....	I, 599	III, 173
603	Seed-Drill .....	I, 374	III, 21
604	Argand Gas Burner .....	I, 719	III, 241
605	Rotary Cultivator .....	I, 372	III, 21
606	Propeller .....	II, 65	III, 309
607	Revolving Fire-Arm .....	II, 552	III, 634
608	Breech-Loading Cannon .....	II, 543	III, 629
609	Spring Bed-Bottom .....	II, 424	III, 561
610	Car-Wheel .....	II, 209	III, 409
611	Floating Revolving Wharf .....	II, 178	III, 366
612	Brick-Machine .....	II, 383	III, 537
613	Reciprocating Rotary Engine .....	II, 10	III, 270
614	Preventing Cars from Running off the Track .....	II, 217	III, 414
615	Adjusting Plane-Irons .....	II, 344	III, 500
616	Furnace for Heating Steam-Boilers .....	I, 711	III, 238
617	Railroad Chair .....	II, 150	III, 370
618	Hemp Harvester .....	I, 416	III, 50
619	Handle for Screw-Drivers .....	I, 569	III, 152
620	Railroad Track and Cast-Iron Pavement .....	II, 158	III, 374
621	Refrigerator .....	II, 475	III, 592
622	Railroad Car Seats and Berths .....	II, 201	III, 406
623	Machine for Sowing Marl, Dirt, &c. ....	II, 279	III, 457
624	Mode of Applying Lever-Power .....	II, 265	III, 447
625	Gas-Regulator .....	I, 680	III, 224
626	Gas-Burner .....	I, 717	III, 241
627	Car-Coupling .....	II, 192	III, 397
628	Corn-Husker .....	I, 410	III, 47
20, 629	Metallic Lath .....	II, 143	III, 366



No.	Invention or Discovery.	Text.	Plates.
20, 630	Metallic Rolling Shutters.....	II, 171	III, 380
631	Pans for Evaporating Cane Juice.....	I, 672	III, 219
632	Cutting Button-Holes.....	II, 570	III, 644
633	Plough.....	I, 457	III, 81
634	Coupling-Box for Shafting.....	II, 319	III, 484
635	Repairing Cast Iron Cylinders.....	I, 508	III, 113
636	Metallic Roofing.....	II, 169	III, 379
637	Corn-Husker.....	I, 367	III, 11
638	Shingle-Machine.....	II, 363	III, 519-20
639	Corn-Planter.....	I, 436	III, 65
640	Air-Heating Furnace.....	I, 709	III, 237
641	Camphene Lamp.....	I, 732	III, 248
642	Machine for Setting Spokes in Hubs.....	II, 389	III, 536
643	Seeding-Machine.....	I, 479	III, 96
644	Washboard.....	II, 484	III, 597
645	Corn-Harvester.....	I, 410	III, 46
646	Horse-Shoe Machine.....	I, 527	III, 195
647	Gang Plough.....	I, 463	III, 85
648	Vapor-Lamp Burner.....	I, 731	III, 248
649	Vapor-Lamp.....	I, 735	III, 250
650	Corn-Sheller.....	I, 361	III, 15
651	Seed-Planter.....	I, 447	III, 74
652	Metallic Wheels for Vehicles.....	II, 230	III, 422
653	Corn-Husker.....	I, 367	III, 11
654	Railroad Car Seat.....	II, 198	III, 403
655	Treatment of Metallic Sulphurets.....	I, 697	.....
656	Seeding-Machine.....	I, 479	III, 98
657	Air Cells for Giving Buoyancy to Vessels.....	II, 73	III, 314
658	Combination Lock.....	I, 540	III, 133
659	Plough.....	I, 457	III, 80
660	Clamping and Feeding the Log in Saw Mills.....	II, 349	III, 504
661	Solutions for Cleansing Woollens, &c.....	I, 664	.....
662	Apparatus for Sifting Coal Ashes.....	I, 703	III, 233
663	Cheese Vat.....	II, 448	III, 575
664	Cabinet for Sewing-Machines.....	I, 649	III, 209
665	Oil Cup for Machinery.....	II, 271	III, 449
666	Ore Separator.....	I, 556	III, 144
667	Furnace for Boilers and Stoves.....	I, 715	III, 240
668	Cooking Stove.....	I, 753	III, 261
669	Frame for Drying Clothes.....	II, 451	III, 578
670	Portfolio File.....	II, 524	III, 619
671	Gas Retort.....	I, 683	III, 225
672	Gearing for Machinery.....	II, 289	III, 464
673	Masting and Rigging Vessels.....	II, 79	III, 319
674	Oil Cups for Lubricating Engines.....	II, 269	III, 448
675	Replacing Railroad Cars on the Track.....	II, 218	III, 415
676	Paddle Wheel.....	II, 64	III, 308
677	Machine for Picking Cop Waste.....	I, 568	III, 165
678	Restoring Waste Vulcanized Rubber.....	I, 694	.....
679	Safety Vault Covers.....	II, 176	III, 335
680	Valves for Dry Gas Meters.....	I, 679	III, 233
681	Skirt Hoops.....	II, 575	III, 647
682	Cooking Stove.....	I, 753	III, 261
683	Stuffing Boxes.....	II, 323	III, 426
684	Sewing-Machine.....	I, 629	III, 197
685	Riveting-Machine.....	I, 562	III, 143
686	Sewing-Machine.....	I, 639	III, 196
687	Arrangement of Steam Coils in Evaporating Vessels.....	I, 673	III, 219
688	Sewing-Machine.....	I, 629	III, 197
689	Drain Plough.....	I, 463	III, 83
20, 690	Machinery for Braiding Cordage.....	I, 589	III, 165

No.	Invention or Discovery.	Text.	Plates.
20, 691	Braided Cordage, Webbing, &c. ....	I, 589	III, 166
692	Grinding Mill .....	II, 305	III, 475
693	Socket for Tool Handle .....	II, 373	III, 529
694	Cotton Seed Planter .....	I, 440	III, 67
695	Machine for Turning Salvages in Cloth .....	I, 588	III, 164
696	Rotary Sawing-Machine .....	II, 355	III, 510
697	Coating Metallic Surfaces .....	I, 664	.....
698	Pantographic Telegraph .....	II, 109	III, 343
699	Sewing-Machine .....	I, 630	III, 198
700	Upsetting Tire .....	I, 577	III, 158
701	Mode of Obtaining Motive Power .....	II, 316	III, 482
702	Rolling Railway Bars .....	I, 563	III, 148
703	Apparatus for Skinning Eels .....	II, 602	III, 660
704	Shingle-Machine .....	II, 364	III, 522
705	Lathe for Turning Oval Frames .....	II, 339	III, 496
706	Electric Signal Lights .....	II, 104	III, 339
707	Button Fastening .....	II, 570	III, 644
708	Pantaloon .....	II, 573	III, 646
709	Seed Planter .....	I, 447	III, 74
710	Ink-Roller .....	II, 507	III, 609
711	Ring Clamp for Engravers, &c. ....	II, 503	III, 608
712	Cultivator .....	I, 3 6	III, 19
713	Horse-Shoe .....	I, 525	III, 123
714	Type Case for Printers .....	II, 526	III, 621
715	Screw Picket .....	II, 609	III, 664
716	Bank and other Locks .....	I, 539	III, 131
717	Pipe Coupling .....	I, 559	III, 146
718	Machine for Cleaning Daguerreotype Plates .....	II, 502	III, 607
719	Harvester .....	I, 401	III, 40
720	Skirt Hoops .....	II, 575	III, 647
721	Illuminated Covers for Vaults, &c. ....	II, 177	III, 388
722	Can for Preserving Food .....	II, 438	III, 570
723	Bedstead .....	II, 426	III, 562
724	Knife and Spoon Cleaner .....	II, 463	III, 586
725	Net for Catching Fish .....	II, 603	III, 660
726	Gauge Cock and Alarm Whistle .....	II, 19	III, 279
727	Cartridge .....	II, 545	III, 630
728	Hand Drill .....	I, 513	III, 117
729	Vapor Lamp .....	I, 735	III, 250
730	Churn .....	I, 349	III, 5
731	Apparatus for Manufacturing White Lead .....	I, 699	III, 231
732	Washing-Machine .....	II, 492	III, 602
733	Cooking Stove .....	I, 753	III, 262
734	Grinding-Mill .....	II, 305	III, 476
735	Grain-Separator .....	I, 381	III, 27
736	Fire and Burglar-Proof Safes .....	I, 563	III, 149
737	Stave-Machine .....	II, 370	III, 527
738	Seed-Planter .....	I, 447	III, 74
739	Sewing-Machine .....	I, 631	III, 198
740	Churn .....	I, 349	III, 5
741	Fountain Pen .....	II, 518	III, 616
742	Sewing-Machine .....	I, 631	III, 198
743	Brad Punch .....	I, 561	III, 147
744	Propeller .....	II, 66	III, 309
745	Machine for Sawing Lumber .....	II, 341	III, 498
746	Burning Fluid Lamp .....	I, 731	III, 248
747	Cotton-Gin .....	I, 597	III, 172
748	Fastening Wick Tubes in Lamp Caps .....	I, 732	III, 248
749	Seed-Planter .....	I, 447	III, 73
750	Bedstead .....	II, 426	III, 562
20, 751	Attaching and Housing Propellers .....	II, 70	III, 311

No.	Invention or Discovery.	Text	Plates.
20,752	Fire-Ladder.....	II, 603	III, 660
753	Sewing-Machine.....	I, 631	III, 198
754	Dentists' Pattern Plates.....	II, 565	III, 641
755	Pure Sulphurous Acid.....	I, 659	III, 215
756	Ore Separator.....	I, 556	III, 145
757	Double-Acting Gun Lock.....	II, 557	III, 636
758	Converting Peat into Charcoal.....	I, 664	.....
759	Sash Fastener.....	I, 516	III, 118
760	Apparatus for Rectifying.....	I, 692	III, 229
761	Sewing-Machine.....	I, 630	III, 197
762	Securing Cutters in Rotary Placing-Machines.....	II, 346	III, 502
763	Sewing-Machine.....	I, 630	III, 198
764	Quilting-Frame.....	II, 574	III, 590
765	Revolving Fire-Arm.....	II, 553	III, 634
766	Drawing Rollers.....	I, 617	III, 185
767	Apparatus for Heating Tires.....	I, 723	III, 244
768	Valve Gearing of Steam-Engines.....	II, 42	III, 294
769	Railroad Car-Brake.....	II, 190	III, 397
770	Machine for Cutting Corks.....	II, 549	III, 658
771	Machine for Cutting Corks.....	II, 599	III, 638
772	Machine for Raking and Loading Hay.....	I, 426	III, 58
773	Sewing Machine.....	I, 632	III, 198
774	Machine for Gathering Stones.....	I, 490	III, 104
775	Sewing-Machine.....	I, 632	III, 198
776	Breech Loading Fire-Arm.....	II, 547	III, 631
777	Railroad Car Seats and Berths.....	II, 149	III, 370
778	Stopper for Bottles.....	II, 594	III, 656
779	Boring-Machine.....	II, 331	III, 496
780	Machine for Upsetting Carriage Axles.....	I, 503	III, 110
781	Corn-Planter.....	I, 436	III, 65
782	Steam-Engine.....	II, 12	III, 273
783	Pump.....	II, 244	III, 434
784	Mill for Cutting and Crushing Sugar-Cane.....	II, 300	III, 471
785	Attaching Lamps to Lanterns.....	I, 736	III, 251
786	Registering Attachment for Clocks.....	II, 90	III, 327
787	Pump.....	II, 248	III, 434
788	Faucet.....	II, 237	III, 427
789	Machine for Turning the Heads and for Nicking Screws.....	I, 571	III, 145
790	Plough.....	I, 457	III, 81
791	Washing-Machine.....	II, 492	III, 602
792	Machine for Testing the Strength in Springs.....	II, 281	III, 459
793	Chair for Railways.....	II, 164	III, 377
794	Lathe for Turning in Metals.....	I, 547	III, 137
795	Running Gear for Wagons.....	II, 233	III, 425
796	Rotary Pump.....	II, 254	III, 438
797	Constructing Iron Railings.....	II, 148	III, 369
798	Cultivator.....	I, 367	III, 19
799	Measuring Faucet.....	II, 238	III, 428
800	Rotating Shafts Without Using a Crank.....	II, 320	III, 465
801	Skirt Hoops.....	II, 576	III, 647
802	Steam Boiler.....	II, 2	III, 266
803	Churn.....	I, 319	III, 5
804	Churn.....	I, 319	III, 6
805	Raking and Binding Attachment to Harvester.....	I, 418	III, 52
806	Harvester.....	I, 401	III, 40
807	Track Clearers for Harvester.....	I, 424	III, 57
808	Harvester-Finger.....	I, 414	III, 49
809	Mode of Securing Grain in Bundles or Sheaves.....	I, 378	III, 668
810	Burglars' Alarm Clock.....	II, 585	III, 651
811	Dust Pan.....	II, 470	III, 589
20,812	Hill-Side Plough.....	I, 464	III, 85

No.	Invention or Discovery.	Text.	Plates.
20, 813	Harvester .....	I, 401	III, 40
814	Machine for Paring, Slicing, and Coring Apples .....	II, 421	560
815	Sausage-Filler .....	II, 478	591
816	Machine for Stuffing Horse-Collars .....	II, 401	550
817	Railroad Car-Coupling .....	II, 195	409
818	Ventilating Millstones .....	II, 311	479
819	Machine for Leathering Tacks .....	II, 410	555
820	Attaching Carriage Springs .....	II, 211	411
821	Machine for Leathering Tacks .....	II, 409	554
822	Sash-Holder .....	I, 564	149
823	Cotton-Cultivator .....	I, 371	21
824	Arrangement of Devices for Planing Mouldings .....	II, 343	499
825	Breech-Loading Fire-Arm .....	II, 547	631
826	Tailors' Measure .....	II, 580	649
827	Treatment of Fibre of Tampico Hemp .....	I, 603	
828	Continuous Chain-Rails .....	II, 101	III, 375
829	Nail-Machine .....	I, 549	139
830	Rice-Hulling Machine .....	I, 428	59
831	Corn-Sheller .....	I, 362	15
832	Trunk-Protector .....	II, 419	559
833	Machine for Hulling Rice .....	I, 430	60
834	Ear, Cheek, and Chin Muff .....	II, 572	646
835	Steam Alarm and Safety Apparatus .....	II, 31	238
836	Furnace .....	I, 709	236
837	Machinery for Pressing Straw Bonnets, &c. ....	I, 585	163
838	Machine for Making Paper Bags .....	II, 513	614
839	Bedstead-Fastening .....	II, 428	563
840	Furnaces of Steam-Boilers .....	II, 5	268
841	Failway Bridge Signalizer .....	II, 164	377
842	Water-Metre .....	II, 246	432
843	Stopper for Bottles .....	II, 595	655
844	Horse Hay-Rakes .....	I, 470	91
845	Valve-Regulator .....	II, 43	294
846	Punch for Perforating Metal .....	I, 515	136
847	Water and Steam Indicator .....	II, 24	284
848	Pressure-Gauge .....	II, 20	280
849	Corn-Husker .....	I, 358	12
850	Lock .....	I, 534	129
851	Magnetic Steam-Gauge .....	II, 19	279
852	Burglars' Alarm Clock .....	II, 584	651
853	Faucet .....	II, 237	427
854	Knitting-Machine .....	I, 605	177
855	Spoke-Shave .....	II, 368	526
856	Kettle for Rendering Lard .....	I, 723	244
857	Spring-Pulley for Window-Sashes .....	II, 132	389
858	Machine for Cutting Paper .....	II, 515	615
859	Door-Plate .....	II, 602	659
860	Machine for Hulling Rice .....	I, 430	60
861	Machine for Dressing Hides and Leather .....	II, 405	553
862	Propeller for Canal Boats .....	II, 68	310
863	Rocking-Chair .....	II, 447	575
864	Machine for Cutting Barrel-Heads .....	II, 327	488
865	Bustles and Skirts .....	II, 569	643
866	Tool for Cutting Cylindrical or Tapering Stocks .....	II, 372	529
867	Force-Pump for Fire-Engines .....	I, 707	235
868	Clothes-Drying Apparatus .....	II, 430	577
869	Metallic Hub for Carriage-Wheel .....	II, 214	413
870	Sawing-Machine .....	II, 352	509
871	Railroad Car-Box Cases and Pedestals .....	II, 148	369
872	Washing-Machine .....	II, 492	602
20, 873	Trap for Animals .....	II, 615	III, 666

No.	Invention or Discovery.	Text.	Plates.
20, 874	Printing-Press .....	II, 531	III, 624
875	Fire-Escape Ladders .....	I, 707	236
876	Shingle-Machine .....	II, 363	520
877	Coppering Interior of Ships to Protect from Lightning .....	II, 75	316
878	Churn .....	I, 350	6
879	Tailors' Shears .....	II, 581	649
880	Pump .....	II, 248	434
881	Machine-Pulleys .....	II, 317	483
882	Shoemakers' Edge-Plane .....	II, 414	557
883	Adjustable Pile-Driver .....	II, 146	368
884	Paper Stock from Reeds .....	I, 617	-----
885	Machine for Drilling and Splitting Stone .....	II, 392	III, 544
886	Carriage for Sawing-Machines .....	II, 353	519
887	Reaping and Mowing-Machine .....	I, 472	93
888	Escapement of Watches .....	II, 118	348
889	Boat Propeller .....	II, 67	310
890	Hemp-Brake .....	I, 601	174
891	Apparatus for Cleaning and Polishing Coffee .....	I, 354	7
892	Endless Chain for Threshing-Machine .....	I, 498	108
893	Knit Gloves .....	I, 603	176
894	Governor for Steam-Engines .....	II, 22	282
895	Refrigerator .....	II, 476	593
896	Medicated Vapor Apparatus .....	II, 564	641
897	Gas Generator .....	I, 677	222
898	Churn .....	I, 350	6
899	Grain-Cleaning Machine .....	I, 378	25
900	Scroll-Sawing Machine .....	II, 356	511
901	Rolling Railway-Chairs .....	I, 563	148
902	Butter-Cooler .....	II, 436	569
903	Attaching Sleigh-Runners .....	II, 228	421
904	Cotton Gin .....	I, 597	172
905	Apparatus as Aids in Extracting Teeth .....	II, 566	642
906	Earthenware Dish .....	II, 456	590
907	Refrigerator .....	II, 476	593
908	Automatic Operator of the Surveyor's Graphodometer .....	II, 106	341
909	Smoke-Stack for Steam Vessels .....	I, 745	256
910	Saw-Mill Block .....	II, 349	505
911	Leather-Shaving Knife .....	II, 408	554
912	Self-Dumping Coal-Bucket .....	II, 130	357
913	Floor Clamp .....	II, 333	492
914	Boot-Tree .....	II, 395	546
915	Tripod Head for Surveyors .....	II, 106	340
916	Securing Lightning Rods .....	II, 98	334
917	Radiator for Heating Buildings, &c., by Combustion of Gas or Alcohol .....	I, 722	243
918	Machine for Manufacturing Chair-Backs .....	II, 332	492
919	Atmospheric Regulator for Stoves, Furnaces, &c. ....	I, 759	265
920	Spinning Frame .....	I, 655	211
921	Water-Wheels .....	II, 259	440
922	Hand-Stamp .....	II, 539	622
923	Machine for Cleaning Grain .....	I, 379	26
924	Cooling Car-Wheels .....	II, 207	406
925	Machine for Polishing Thread .....	I, 656	214
926	Furnace for Manufacturing Oxide of Zinc .....	I, 712	239
927	Tube-Joint for Condensers .....	II, 9	269
928	Connecting the Ends of Railroad-Rails .....	II, 154	372
929	Knife-Cleaner .....	II, 464	585
930	Rendering Telegraphic Magnets Easy of Adjustment .....	II, 112	345
931	Twine-Box .....	II, 617	667
932	Washing Machine .....	II, 493	602
20, 933	Machine for Sharpening Gin-Saws .....	I, 567	III, 151

No.	Invention or Discovery.	Text.	Plates.
20, 934	[Cancelled] .....		
935	Plough .....	I, 457	III, 81
936	Machine for Cutting Out the Soles of Boots and Shoes...	II, 397	547
937	Fire-Boxes for Locomotive Engines .....	II, 27	286
938	Manufacture of Hard Rubber Goods .....	I, 693	
939	Steam-Heater .....	I, 721	III, 242
940	Spring-Bolt .....	I, 506	112
941	Grinding-Mill .....	II, 306	475
942	Watch-Case .....	II, 117	347
943	Carpenter's Rule .....	II, 104	338
944	Canal-Boat .....	II, 52	300
945	Saw-Filing Machine .....	I, 565	149
946	Seed-Drill .....	I, 375	23
947	Machine for Pressing Grapes .....	II, 279	456
948	Casting Hinges .....	I, 509	114
949	Machine for Digging Potatoes .....	I, 467	88
950	Millstone Dress .....	II, 310	478
951	Cast-Iron Kettles .....	I, 510	114
952	Vapor-Burning Lamp .....	I, 736	251
953	Propeller .....	II, 66	309
954	Breech-Loading Fire-Arm .....	II, 547	631
955	Machine for Making Chain .....	I, 510	115
956	Feeding the Tool-Carriage in Turning Lathes .....	II, 341	497
957	Machine for making Axe-Poles .....	I, 502	110
958	Straw-Cutter .....	I, 493	106
959	Railroad-Switch .....	II, 157	374
960	Heel-Shavers for Boots and Shoes .....	II, 397	547
961	Firemen's Trumpets .....	II, 603	660
962	Cutting both Bevels simultaneously on Barrel-Heads .....	II, 327	488
963	Steam-Stove .....	II, 36	291
964	Clothes-Dryer .....	II, 449	576
965	Hanging up and carrying off Paper Hangings .....	II, 515	615
966	Manufacture of Steatite Articles .....	I, 696	230
967	Apparatus for Rectifying .....	I, 692	229
968	Plough .....	I, 457	81
969	Loom .....	I, 608	178
970	Electro-Magnetic House-Alarm .....	II, 95	332
971	Machine for Hulling and Cleaning Rice .....	I, 427	59
972	Flouring-Mill .....	II, 299	471
973	Cotton-Press .....	II, 276	453
974	Clothes Rack .....	II, 474	590
975	Soldering-Iron .....	I, 573	155
976	Straw-Shaker .....	I, 496	107
977	Burners and Wick-Tubes of Vapor Lamps .....	I, 728	246
978	Horse Power .....	II, 292	466
979	Fluid-Metre .....	II, 245	432
980	Converting Rotary into Reciprocating Motion .....	II, 314	481
981	Stone-Sawing Machine .....	II, 392	544
982	Self-Adjusting and Embossing Telegraphic Machine .....	II, 110	344
983	Coupling for Railroad-Cars .....	II, 219	415
984	Plough .....	I, 458	81
985	Water-Proof Cements .....	I, 663	
986	Omnibus-Register .....	II, 227	III, 420
987	Bearing Blocks of Truss Bridges .....	II, 122	352
988	Counterpoising Gasometers .....	I, 685	226
989	Plates for Burglar-Proof Safes .....	I, 744	256
990	Sewing-Machine .....	I, 633	199
991	Axle Box .....	II, 184	390
992	Cutting Boot Fronts .....	II, 394	545
993	Paints .....	I, 688	227
994	Sewing-Machine .....	I, 633	
20, 995	Sawing-Machine .....	II, 353	III, 509

No.	Invention or Discovery.	Text.	Plates.
20, 996	Operating Window-Blinds.....	II, 180	III, 388
997	Harness Tug-Buckle.....	II, 405	552
998	Railroad Car-Spring.....	II, 205	407
999	Stock for Cutters in Rotary Planing-Machines.....	II, 347	533
21, 000	Apparatus for Distributing Steam.....	II, 31	288
1	Valves for Gas Apparatus.....	I, 676	221
2	Wheelwrights'-Machine.....	II, 375	532
3	Regulating the Supply of Water to Steam-Boilers.....	II, 4	267
4	Machinery for Piling Paper.....	I, 614	183
5	Nails.....	I, 552	141
6	Signal Lantern for Railroad Switches.....	II, 157	373
7	Compound Rail for Railroads.....	II, 159	375
8	Paper-Making Machines.....	I, 614	184
9	Bran-Duster.....	II, 287	462
10	Churn.....	I, 350	I, 6
11	"Flushing Valve" Trap for Sinks, Sewers, &c.....	II, 171	III, 380
12	Hanging Carriages for Children.....	II, 215	413
13	Grate for Steam-Boilers.....	II, 6	268
14	Splice Piece for Railroad-Rails.....	II, 155	372
15	Sewing-Machine.....	I, 632	199
16	Closet for Milk.....	II, 469	586
17	Steam-Boiler.....	II, 2	266
18	Wheat-Drill.....	I, 376	24
19	Adjusting Mosquito-Bars.....	II, 469	586
20	Combination of the Needle and Sun-Dial.....	II, 113	345
21	Grate for Locomotive Engines.....	II, 27	286
22	Gas-Regulator.....	I, 681	224
23	Compounds for Treating Potato-Rot.....	I, 668	-----
24	Operating Printing Telegraphic-Machines.....	II, 112	III, 345
25	Brick-Machine.....	II, 383	537
26	Coupling for Horse-Railing Cars.....	II, 218	415
27	Illuminating Gas.....	I, 678	222
28	Machine for Weighing and Registering Grain.....	II, 281	459
29	Clothes-Wringer.....	II, 452	579
30	Feeding Quartz, &c., to Crushing and Grinding Machines.....	II, 287	463
31	Corn-Harvester.....	I, 410	47
32	Horse-Power Machine.....	II, 294	467
33	Protecting Trees from Insects.....	I, 668	216
34	Seed-Planter.....	I, 448	74
35	Clothes-Dryer.....	II, 449	576
36	Machine for Cleaning Grain.....	I, 379	26
37	Brace for Locking the Panels of Field-Fences.....	II, 137	363
38	Railroad Car-Brake.....	II, 191	396
39	Steel Rollers.....	I, 576	157
40	Alarm-Gauge for Steam-Boilers.....	II, 4	267
41	Drawing Instrument.....	II, 91	328
42	Batter-Machine.....	II, 422	560
43	Pump.....	II, 248	434
44	Mangle.....	II, 465	586
45	Knitting-Machine.....	I, 605	177
46	Stove for Burning Soft Coal.....	I, 756	263
47	Steam-Heating Apparatus.....	II, 35	290
48	Gas-Regulator.....	I, 681	224
49	Sewing-Machine.....	I, 633	199
50	Illuminating Glasses for Vault-Covers.....	II, 176	365
51	Machine for Pegging Shoes.....	II, 415	557
52	Railroad Car-Seat.....	II, 198	402
53	Burner for Vapor Lamps.....	I, 729	247
54	Revolving Fire-Arm.....	II, 553	634
55	Cultivator.....	I, 367	19
21, 056	Governor for Steam-Engines.....	II, 23	III, 263

No.	Invention or Discovery	Text.	Plates.
21, 057	Wheat-Separators .....	I, 500	III, 109
58	Knife-Sharpener .....	II, 464	585
59	Steam-Engine .....	II, 12	274
60	Removing Sub-Marine Deposits .....	II, 166	378
61	Substitute for the Crank .....	II, 287	463
62	Flouring-Mill .....	II, 300	471
63	Grain and Grass Harvester .....	I, 415	49
64	Metallic Fence .....	II, 135	362
65	Converting Reciprocating into Rotary Motion .....	II, 314	481
66	Apparatus for making Coffee .....	II, 453	579
67	Railroad Frog .....	II, 152	371
68	Cap-Tubes for Shuttles .....	I, 652	210
69	Lamp .....	I, 725	245
70	Sleeping-Car for Railroads .....	II, 224	418
71	Tube for Conveyance of Sound .....	II, 255	433
72	Apparatus for Condensing and Purifying Gas .....	I, 673	220
73	Field-Fence .....	II, 134	361
74	Field-Fence .....	II, 134	361
75	Gas-Stove .....	I, 757	263
76	Gas-Burner .....	I, 717	241
77	Separating the Fibres of Wood .....	I, 592	167
78	Preserve-Can .....	II, 439	570
79	Mode of Operating Presses .....	II, 278	456
80	Printing-Press .....	II, 531	623
81	Safety Whiffletrees .....	II, 234	425
82	Money-Table .....	II, 608	663
83	Hub for Carriage-Wheel .....	II, 213	412
84	Stove .....	I, 747	258
85	Combined Broiling-Furnace and Cooking-Stove .....	I, 701	232
86	Brake for Railroad-Cars .....	II, 217	414
87	Ox-Yoke .....	I, 500	109
88	Chuck for Centering, &c. ....	I, 511	116
89	Sewing-Machine .....	I, 633	199
90	Argand Gas-Burner .....	I, 719	241
91	Pegging-Machine .....	II, 411	555
92	Case Shoe Brush .....	II, 435	568
93	Harvester .....	I, 402	40
94	Fire-Place .....	I, 707	236
95	Apparatus for Purifying Gas .....	I, 675	220
96	Apparatus for Purifying Gas .....	I, 675	221
97	Connecting Railroad-Rails .....	II, 154	372
98	Loom .....	I, 609	179
99	Sleeping-Car for Railroads .....	II, 224	418
100	Sewing-Machine .....	I, 634	200
101	Registering the Motion of Machinery .....	II, 103	337
102	Seed-Planter .....	I, 448	75
103	Stove .....	I, 747	257
104	Machine for Manufacturing Shoe-Pegs .....	II, 413	557
105	Electro-Magnetic Engine .....	II, 94	332
106	Butter-Worker .....	II, 437	569
107	Mechanical Jack .....	II, 268	446
108	Making Beef and other Steaks Tender .....	II, 431	565
109	Centrifugal Gun .....	II, 557	636
110	Straw-Cutter .....	I, 494	107
111	Machine for Threshing and Separating Grain .....	I, 496	107
112	Seed-Planter .....	I, 448	74
113	Harrow .....	I, 385	29
114	Machine for Rolling Leather into Bales .....	II, 408	554
115	Wind-Guard for Chimneys .....	I, 703	233
116	Operating the Teeth of Cylinders for Burring Wool, &c. ....	I, 658	214
117	Machine for Chamfering and Crozing Barrels .....	II, 327	488
21, 118	Metallic Lath-Surface .....	II, 143	III, 366



No.	Invention or Discovery.	Text.	Plates.
21, 119	Safety-Guard for Safe-Doors .....	I, 744	III, 256
120	Applying Brakes to Hand-Trucks .....	II, 121	351
121	Apparatus for Purifying Gas .....	I, 676	221
122	Treatment of Caoutchouc .....	I, 662	-----
123	Bed-Bottom .....	II, 423	III, 561
124	Hinge .....	I, 522	122
125	Harvester .....	I, 402	40
126	Apparatus for Tanning Hides .....	II, 417	559
127	Seed-Planter .....	I, 449	75
128	Cultivator .....	I, 367	19
129	Sewing-Machine .....	I, 634	200
130	Locomotive Steam-Engine .....	II, 28	286
131	Clothes Rack .....	II, 475	590
132	Telegraphic Instrument .....	II, 110	344
133	Apparatus for Heating and Cooling Air, as a Motive Power .....	II, 316	482
134	Ships' Windlass .....	II, 75	316
135	Cable-Stopper .....	II, 56	302
136	Hanging Window-Sash .....	II, 181	388
137	Seed-Planter .....	I, 449	75
138	Bathing Apparatus .....	II, 561	639
139	Machine for Cleaning Wheat .....	II, 324	496
140	Rock-Drill .....	II, 128	357
141	Machine for Coring and Quartering Apples .....	II, 421	562
142	Apparatus for Generating Gas .....	I, 674	220
143	Retorts for Distilling Oils from Coal .....	I, 671	217
144	Machine for Fanning and Assorting Grain .....	II, 290	465
145	Counter Scales .....	II, 280	456
146	Escapement for Time-Keeper .....	II, 114	346
147	Bake-Oven .....	I, 739	253
148	Printing Ink-Roller .....	II, 529	-----
149	Repeating Fire-Arm .....	II, 550	III, 633
150	Hay-Elevators .....	I, 425	58
151	Steam-Valve .....	II, 45	296
152	Seeding-Machine .....	I, 480	99
153	Harrow .....	I, 385	30
154	Printing-Press .....	II, 532	624
155	Steam-Valve .....	II, 46	296
156	Machine for Pounding Rice .....	II, 317	433
157	Folding Gridiron .....	I, 720	242
158	Cement for Roofing Purposes .....	I, 663	-----
159	Billiard-Cushions .....	II, 590	III, 654
160	Variable Boring Bit .....	II, 330	490
161	Reducing Wood-Fibres to Paper-Pulp .....	I, 616	185
162	Seeding-Machine .....	I, 479	99
163	Bee-Hives .....	I, 344	1
164	Machinery for Forming Bats for Felting .....	I, 591	167
165	Steam-Engine .....	II, 12	274
166	Burner for Vapor-Lamps .....	I, 729	247
167	Plough .....	I, 458	82
168	Tanning Hides .....	II, 417	-----
169	Gas-Retort .....	I, 683	III, 235
170	Cultivator .....	I, 367	19
171	Cooking-Stove .....	I, 754	262
172	Machine for Folding Paper .....	II, 516	615
173	Machine for Preparing Frames for Gilding .....	II, 506	564
174	Corn-Sheller .....	I, 362	15
175	Washing-Machine .....	II, 493	602
176	Churn .....	I, 351	6
177	Cross-Cut Sawing-Machine .....	II, 354	510
178	Railroad Car-Seat .....	II, 199	403
21, 179	Securing Cutters to the Spindles of Augers .....	II, 325	III, 487

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21, 180	Corn-Planter .....	I, 436	III, 65
181	Machine for Sowing Fertilizers .....	I, 488	103
182	Plough .....	I, 458	82
183	Operating Steam Trip-Hammers .....	II, 38	291
184	Mill Pick-Holders .....	II, 308	478
185	Steam-Heating Apparatus .....	I, 722	243
186	Brick-Machine .....	II, 383	538
187	Corn-Planter .....	I, 437	66
188	Revolving Fire-Arm .....	II, 554	634
189	Pessaries .....	II, 565	641
190	Metallic Bands for Binding Bales .....	II, 264	443
191	Stove .....	I, 748	257
192	Machine for Preparing Oval Picture-Frames .....	II, 524	619
193	Lock .....	I, 534	129
194	Machine for Cutting Mitres .....	II, 342	499
195	Apparatus for Heating Mash-Tubs .....	I, 722	243
196	Wrench .....	I, 583	162
197	[Suspended] .....		
198	Nail-Plate Feeder .....	I, 550	III, 140
199	Securing and Adjusting the Steps of Mill-Spindles .....	II, 309	478
200	Reciprocating Sawing-Machine for Sawing Plank .....	II, 355	510
201	Construction of Canal-Boats .....	II, 55	302
202	Smut-Machine .....	II, 322	486
203	Bridge .....	II, 121	352
204	Amalgamating Gold and Silver .....	I, 502	110
205	Rock-Drill .....	II, 128	357
206	Excavating Machine .....	II, 130	358
207	Reaping-Machine .....	I, 473	94
208	Feed-Motion for Carotypography .....	II, 500	607
209	Lantern for Burning Coal-Oil .....	I, 738	252
210	Steering-Apparatus .....	II, 77	317
211	Carpet-Cleaner .....	II, 440	571
212	Grain-Drill .....	I, 372	22
213	Machine for Forging Nails .....	I, 552	141
214	Threshing-Machine .....	I, 497	108
215	Revolving Fire-Arm .....	II, 553	634
216	Washing-Machine .....	II, 493	603
217	Seed-Planter .....	I, 449	75
218	Andiron .....	II, 420	560
219	Bob-Lance .....	II, 541	629
220	Butter-Bucket .....	II, 436	569
221	Operating-Churn .....	I, 353	7
222	Nail-Plate Feeder .....	I, 550	140
223	Combination Shoe-Tool .....	II, 414	557
224	Sewing-Machine .....	I, 635	200
225	Machine for Digging Potatoes .....	I, 467	89
226	Machine for Digging Potatoes .....	I, 467	89
227	Grain-Separator .....	I, 381	27
228	Printing-Press .....	II, 532	624
229	Gas-Burner .....	I, 717	241
230	Sewing-Machine .....	I, 634	200
231	Clothes-Horse .....	II, 451	577
232	Chuck for Lathes .....	II, 338	495
233	Carpet-Sweeper .....	II, 443	572
234	Sewing-Machine .....	I, 635	201
235	Steam-Valve .....	II, 46	296
236	Addometer .....	II, 85	324
237	Steam-Cock .....	II, 32	288
238	Machine for Making Rope .....	I, 618	195
239	Vapor Lamp-Burner .....	I, 731	248
21, 240	Lathe for Turning Beaded-Work .....	II, 339	III, 495

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21, 241	Railroad-Rail .....	II, 154	III, 372
242	Spinning-Mules .....	I, 655	213
243	Addometer .....	II, 86	324
244	Coupling for Railroad-Cars .....	II, 220	416
245	Apparatus for Cooling and Ventilating Grain .....	II, 2-9	465
246	Roofing Composition .....	II, 168	378
247	Carpenters' Work-Bench .....	II, 332	491
248	Quartz-Crushers .....	I, 562	148
249	Writing-Desk .....	II, 601	659
250	Sewing-Machine .....	I, 635	201
251	Car-Seats and Couches .....	II, 201	405
252	Seeding-Machine .....	I, 480	99
253	Cartridge for Fire Arms .....	II, 545	630
254	Machine for Cutting up Cornstalks .....	I, 363	16
255	Metallic Springs .....	II, 228	421
256	Cross-cut Sawing-Machine .....	II, 354	510
257	Seeding-Machine .....	I, 4-1	99
258	Sewing-Machine .....	I, 636	201
259	Running-Gear for Railroad-Car .....	II, 221	416
260	Portable Field-Fence .....	II, 136	362
261	Washing-Machine .....	II, 494	602
262	Music-Stool .....	II, 510	611
263	Bed-Bottom .....	II, 423	561
264	Machine for Breaking Hemp .....	I, 603	177
265	Rotary-Harrow .....	I, 387	30
266	Rail for Switching Cars off the Track .....	II, 161	376
267	Harness .....	II, 403	550
268	Horse-Rake .....	I, 469	90
269	Harrow .....	I, 386	30
270	Elastic Fabrics .....	I, 590	-----
271	Oven .....	I, 739	III, 253
272	Metallic Bands or Ties for Bales .....	II, 265	443
273	Seeding-Machine .....	I, 480	99
274	Packages for Dry-Goods .....	II, 609	664
275	Ice-Stand .....	II, 481	595
276	Steam-Cock .....	II, 32	288
277	Machinery for Bolting Flour .....	II, 286	462
278	Harpoon-Lance .....	II, 58	304
279	Bolt-Machine .....	I, 506	111
280	Windlass .....	II, 85	323
281	Gas-Regulator .....	I, 682	225
282	Fire-Escape .....	II, 6-2	660
283	Water-Meter .....	II, 247	433
284	Apparatus Attached to Steam Coils in Vats .....	I, 698	231
285	Composition for Miniature Cases .....	I, 665	-----
286	Tempering Wire and Steel .....	I, 591	III, 161
287	Corn-Planter .....	I, 437	65
288	Corn-Shelling Machine .....	I, 363	16
289	Attachments to Artificial Legs .....	II, 564	641
290	Locomotive Engine .....	II, 26	285
291	Obstetrical Chair .....	II, 564	641
292	Machine for Setting Staples in Blind Slate .....	II, 120	350
293	Lock .....	I, 534	129
294	Water-Closet .....	II, 124	353
295	Valve Gear of Steam-Engines .....	II, 40	293
296	Chain Stopper .....	II, 57	303
297	Apparatus for Broiling, Toasting, &c. .....	I, 701	232
298	Anchor Ball .....	II, 52	300
299	Sewing-Machine .....	I, 636	201
300	Cut-off Valve of Steam-Engines .....	II, 48	298
21, 301	Horse-Collar Blocks .....	II, 401	III, 549

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21, 302	Trap for Animals.....	II, 615	III, 666
303	Carpet-Stretcher .....	II, 442	572
304	Burnishing-Machine.....	I, 508	113
305	Coupling for Bale-Hoops.....	II, 263	443
306	Hill-side Plough.....	I, 464	86
307	Machine for Cleaning Hose, &c.....	II, 240	429
308	Cotton-Seed Planter .....	I, 440	67
309	Removing Sparks from Smoke-Stacks of Locomotives.....	II, 27	226
310	Sewing-Machine.....	I, 637	201
311	Screwing Plane-Irons to the Stocks of Bench Planes.....	II, 345	501
312	Looms for Weaving Skirt-Fringe.....	I, 610	180
313	Umbrella .....	II, 581	650
314	Seeding Machine.....	I, 482	100
315	Portable Fence.....	II, 136	362
316	Seed-Drill .....	I, 375	23
317	Cotton-Press.....	II, 276	453
318	Rotary Pump.....	II, 254	438
319	Shears.....	I, 573	155
320	Recumbent Chair.....	II, 446	574
321	Printers' Composing Stick.....	II, 526	620
322	Sewing-Machine.....	I, 637	201
323	Seeding-Machine.....	I, 482	100
324	Sun-Shade.....	II, 580	649
325	Carpet-Fastener.....	II, 441	571
326	Railroad Car-Seat.....	II, 199	404
327	Upsetting Carriage-Tire.....	I, 577	158
328	Sash-Fastener.....	I, 516	118
329	Sending and Receiving Messages Simultaneously over the same Telegraphic Wire.....	II, 109	343
330	Hanging Millstones.....	II, 311	479
331	Car-Seats and Couches.....	II, 201	405
332	Steam-Cock.....	II, 33	288
333	Spinning-Machine.....	I, 655	212
334	Stretching Boots and Shoes.....	II, 398	548
335	Portable House-Bell.....	II, 431	565
336	Drawing Boards.....	II, 502	608
337	Sad-Iron Heater Cover.....	II, 478	594
338	Hydrant.....	II, 243	431
339	Prison Alarm.....	II, 567	652
340	Flouring-Mill.....	II, 300	472
341	Lock-Joint Fastener for Steeds, &c.....	II, 540	628
342	Lifting-Jack.....	II, 268	446
343	Harvesting Machine.....	I, 424	57
344	Lamp .....	I, 725	245
345	Attaching the Spreader to Saws of Circular Sawing-Machines.....	II, 357	512
346	Lock .....	I, 535	129
347	Hinge for Window-Blinds.....	I, 523	123
348	Sealing Preserve-Cans.....	II, 440	571
349	Seeding-Machine.....	I, 482	100
350	Seeding-Machine.....	I, 482	100
351	Machine for Bending Fellies.....	II, 329	489
352	Railroad Car-Seat.....	II, 199	404
353	Children's Carriages.....	II, 210	410
354	Seeding-Machine.....	I, 481	99
355	Hemming Guides for Sewing-Machines.....	I, 640	209
356	Car-Seat.....	II, 196	401
357	Cotton-Gin.....	I, 597	172
358	Horse-Rake.....	I, 469	90
359	Welding Bellows-Pipe.....	I, 581	161
360	Tightening and Securing Metallic Bands for Cotton-Bales.....	II, 264	443
21, 361	Oiling the Thread for Sewing-Machines.....	I, 650	III, 210

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21, 362	Machine for Making Chain.....	I, 511	III, 114
363	Corn-Husker.....	I, 358	12
364	Carding-Machine.....	I, 586	164
365	Carpet-Fastener.....	II, 441	571
366	Valve-Cock.....	II, 38	292
367	Straw-Carriers for Threshing-Machines.....	I, 499	109
368	Shutter-Operators.....	I, 573	156
369	Shears.....	II, 573	646
370	Window-Fastener.....	I, 518	119
371	Apparatus for Paying Out Telegraphic Cable.....	II, 107	341
372	Fare-Box for Omnibusses.....	II, 227	420
373	Clasp for Hoop-Skirts.....	II, 576	647
374	Churn.....	I, 351	6
375	Seeding-Machine.....	I, 481	100
376	Feet-Warming Device.....	I, 760	265
377	Cultivator.....	I, 368	20
378	Propeller for Boats.....	II, 68	310
379	Machine for Cutting Irregular Forms.....	II, 335	493
380	Rolling Railway-Chairs.....	II, 164	377
381	Bracelet.....	II, 500	607
382	Hat-Body Machinery.....	I, 599	173
383	Grain-Separator.....	I, 381	27
384	Travelling-Casket.....	II, 596	666
385	Washing-Machine.....	II, 494	603
386	Implement for Rolling and Piling Logs.....	II, 144	367
387	Apparatus for Roasting Coffee.....	I, 744	255
388	Bridge.....	II, 122	352
389	Seeding-Machine.....	I, 481	99
390	Safety-Valve and Pressure-Gauge.....	II, 44	295
391	Attaching the Props of Carriage-Bows.....	II, 209	409
392	Ox-Yokes.....	I, 501	109
393	Corn-Planter.....	I, 437	66
394	Trace-Fastening.....	II, 419	559
395	Inkstand.....	II, 508	610
396	Knitting-Machine.....	I, 605	177
397	Seed-Planter.....	I, 460	75
398	Regulating Tension of Thread in Sewing-Machines.....	I, 651	210
399	Cut-Off for Steam-Engines.....	II, 17	278
400	Revolving Fire-Arm.....	II, 554	634
401	Harvester.....	I, 402	40
402	Sewing-Machine.....	I, 638	202
403	Harrow.....	I, 396	30
404	Corn-Planter.....	I, 438	66
405	Coal or Ashes Sifter.....	I, 745	256
406	Joints for Railroad Tracks.....	II, 159	374
407	Water-Closet.....	II, 124	354
408	Operating Window-Blinds.....	II, 181	388
409	Cane Seat for Chairs.....	II, 447	575
410	Grates for Coal-Stoves.....	I, 758	264
411	Machine for Rolling Paper.....	II, 516	616
412	Car-Seats and Couches.....	II, 202	405
413	Machine for Digging Potatoes.....	I, 468	89
414	Cutting Devices for Harvesters.....	I, 413	43
415	Fruit-Box.....	II, 459	582
416	Coffee-Roaster.....	I, 743	255
417	Window-Blinds.....	II, 179	357
418	Printing and Numbering Press.....	II, 527	621
419	Machine for Moulding Clay.....	II, 386	540
420	Convertible Carriage-Shafts.....	II, 211	410
421	Meat-Cutter.....	II, 468	587
21, 422	Hanging Bells.....	II, 432	III, 565

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21, 423	Plough.....	I, 459	III, 82
424	Applying Soles to Boots and Shoes.....	II, 396	546
425	Escapement of Time-Keepers.....	II, 114	346
426	Railroad Indicator.....	II, 153	371
427	Iron Safe.....	I, 564	149
428	Cultivator.....	I, 368	20
429	Printing Addresses on Newspapers, &c.....	II, 527	621
430	Preparing Elliptical Frames for Gilding.....	II, 505	609
431	Hoisting and Dumping Apparatus.....	II, 142	366
432	Paddle-Wheel Propellers.....	II, 65	309
433	Governor-Valve for Steam-Engines.....	II, 42	294
434	Binding Attachment to Reaping-Machine.....	I, 473	94
435	Calipers and Dividers.....	II, 88	325
436	Couches for Railroad-Cars.....	II, 219	415
437	Raking Attachments to Harvester.....	I, 422	58
438	Scythe-Blades.....	I, 572	154
439	Harrow.....	I, 386	30
440	Seed-Planter.....	I, 450	75
441	[Suspended].....		
442	Kneading-Machine.....	II, 463	III, 585
443	Machine for Turning Hubs.....	II, 373	530
444	Billiard-Balls.....	II, 590	654
445	Coal-Stove.....	I, 750	259
446	Stove.....	I, 748	258
447	Construction of Coal-Stove Lining.....	I, 758	264
448	Loom.....	I, 609	179
449	Hose-Carriage.....	II, 210	410
450	Machine for Ironing Clothes.....	II, 462	584
451	Carpet-Sweeper.....	II, 443	573
452	Seeding-Machine.....	I, 483	100
453	Manufacturing Shingles from the Log.....	II, 366	523
454	Trap for Animals.....	II, 615	667
455	Operating Valves of Steam-Engines.....	II, 51	299
456	Portable Copying Apparatus.....	II, 501	607
457	Alarm Lock.....	II, 586	651
458	Brick-Machine.....	II, 384	538
459	Allowing for Expansion and Contraction of Wire Fences.....	II, 138	363
460	Butter-Worker.....	II, 437	569
461	Sewing-Machine.....	I, 639	202
462	Life-Boat Constructed of Mattresses.....	II, 60	305
463	Bullet-Machine.....	II, 542	629
464	Brushes.....	II, 435	568
465	Sewing-Machine.....	I, 637	202
466	Sewing-Machine.....	I, 638	202
467	Flues of Elevated Oven Cooking-Stoves.....	I, 759	264
468	Steam Pressure and Water Indicator.....	II, 36	290
469	Couch Seats for Railroad-Cars.....	II, 218	415
470	Diaphragm for Photographic Cameras.....	II, 521	617
471	Railroad-Chair.....	II, 150	370
472	Steam Trap.....	II, 37	291
473	Apparatus for Stamping Milk-Cane.....	II, 610	665
474	Journal Box.....	II, 295	468
475	Governor for Steam-Engines.....	II, 23	283
476	Washing-Machine.....	II, 494	603
477	Washing-Machine.....	II, 494	603
478	Revolving Fire-Arm.....	II, 554	635
479	Ladies' Hoop Skirts.....	II, 577	648
480	Joints for T-Rails.....	II, 162	376
481	Skirting Material.....	I, 654	212
482	Endless Sectional Sawing-Machine.....	II, 355	510
21, 483	Saw-File.....	I, 564	III, 149

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21, 484	Printing-Press.....	II, 533	III, 625
485	Lantern Attachment to Caps.....	I, 737	252
486	Railroad Car-Coupling.....	II, 196	400
487	Moulds for Making Warp-Dresser Guides of Glass or other Plastic Anti-Corrosive Material.....	I, 657	214
488	Warp-Dresser Guides.....	I, 657	213
489	Steam-Hammer.....	II, 34	289
490	Shingle-Machine.....	II, 364	522
491	Mole Plough.....	II, 146	368
492	Telegraph Insulator.....	II, 108	342
493	Combination of a Governor with a Side Valve.....	II, 44	295
494	Rotary Steam-Engine.....	II, 11	273
495	Horse-Power.....	II, 293	466
496	Gate-Hinge.....	I, 524	123
497	Gas-Burner.....	I, 718	241
498	Building Walls under Water.....	II, 178	386
499	Cutting Apparatus for Harvesters.....	I, 412	48
500	Heating Apparatus for Manufacture of Cemented Sole Shoes.....	II, 415	-----
501	Churn.....	I, 351	III, 6
502	Railroad Car-Coupling.....	II, 196	400
503	Machine for Cutting Dovetails.....	II, 334	492
504	Door-Lock.....	I, 541	133
505	Bullet-Machine.....	II, 542	629
506	Machine for Working Clay.....	II, 326	540
507	Machine for Notching and Trimming Hoops.....	II, 334	492
508	Cutting and Finishing the Locks of Wooden Hoops.....	II, 334	492
509	Machine for Coating Electrotypes Moulds.....	II, 503	606
510	Valve-Cock.....	II, 39	292
511	Bedstead-Fastening.....	II, 428	564
512	Tenoning-Machine.....	II, 371	588
513	Hemp-Brake.....	I, 601	174
514	Meat-Cutter.....	II, 468	587
515	Temples for Looms.....	I, 613	189
516	Corn-Harvester.....	I, 411	47
517	Clasps for Cotton-Bale Hoops.....	II, 263	443
518	Cooking-Stove.....	I, 754	262
519	Bed-Bottom.....	II, 423	561
520	Spring Balance in Combination with a Knife.....	II, 262	443
521	Lantern.....	I, 737	251
522	Corn-Husker.....	I, 358	12
523	Fire-Arm.....	II, 547	631
524	Combination Steam-Valve.....	II, 39	292
525	Pliers.....	I, 560	147
526	Gate.....	II, 138	363
527	Bedstead.....	II, 426	562
528	Printing-Press.....	II, 533	625
529	Portable Field-Fence.....	II, 136	362
530	Filling Water-Tanks at Railway Stations.....	II, 175	384
531	Screw-Cutter.....	I, 568	159
532	Apparatus for Raising Sunken Vessels.....	II, 82	321
533	Guard-Fingers for Harvester.....	I, 416	49
534	Launching Vessels.....	II, 80	319
535	Pressure and Vacuum Valve.....	II, 43	294
536	Car-Seats and Couches.....	II, 202	405
537	Sewing-Machine.....	I, 639	292
538	Machinery for Drawing and Twisting Wool.....	I, 658	214
539	Stone-Holding Machine.....	II, 391	543
540	Raking and Binding Apparatus for Harvester.....	I, 418	53
541	Pin-Sticking Machine.....	I, 558	145
542	Harrow.....	I, 3-6	30
21, 543	Look.....	I, 535	III, 129

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21, 544	Gas-Regulator.....	I, 682	III, 225
545	Brick-Machine.....	II, 384	538
546	Shears.....	I, 572	154
547	Press and Drill-Plough.....	I, 464	86
548	Truss-Pad.....	II, 568	643
549	Portable Field-Fence.....	II, 136	362
550	Rotary Pump.....	II, 254	438
551	Nut-Machine.....	I, 554	143
552	Raking Attachment for Harvester.....	I, 421	55
553	Roofing-Cement.....	II, 167	.....
554	Inkstand.....	II, 508	III, 610
555	Burglars' Alarm.....	II, 583	650
556	Machine for Sorting Silk or Thread According to its Size..	I, 653	210
557	[Suspended].....	.....	.....
558	Cigar-Wrapper.....	II, 597	.....
559	Machine for Washing Coal.....	I, 704	III, 234
560	Pump.....	II, 249	431
561	Pump.....	II, 249	434
562	Dentists' Chair.....	II, 562	639
563	Smut-Machine.....	II, 322	486
564	Applying Soles to Boots and Shoes.....	II, 396	546
565	Washing-Machine.....	II, 495	603
566	Needles for Knitting-Machines.....	I, 608	178
567	Machine for Cutting Metal Bars.....	I, 544	134
568	Brush-Cylinders for Spreaders, Cotton-Gins, &c.....	I, 585	163
569	Self-Acting Wagon-Brake.....	II, 232	424
570	Expandible Floats for Life-Boats.....	II, 60	305
571	Horse-Shoe.....	I, 525	123
572	Canal Boat.....	II, 53	301
573	Machine for Cutting Grass.....	I, 382	28
574	Mode of Preventing Nuts from Unscrewing.....	I, 555	144
575	Churn.....	I, 351	6
576	Lamp.....	I, 725	245
577	Rotary Harrow.....	I, 387	31
578	Water-Wheel.....	II, 259	440
579	Rotary-Valve for Steam-Engines.....	II, 39	292
580	Rotary Harrow.....	I, 387	31
581	Eylet Fastenings for Ladies' Skirts.....	II, 577	648
582	Cotton-Gin.....	I, 593	172
583	Corn-Planter.....	I, 438	66
584	Apparatus for Coloring Paper.....	II, 517	616
585	Skate-Irons.....	II, 610	664
586	Gas-Burner.....	I, 718	241
587	Harvester.....	I, 403	40
588	Saw-Mill.....	II, 348	504
589	Tea-Pot.....	II, 473	590
590	Machine for Cutting Veneers.....	II, 374	530
591	Automatic Paper-Feeder for Printing-Presses.....	II, 535	626
592	Sewing-Machine.....	I, 639	203
593	Machine for Pegging Boots and Shoes.....	II, 397	547
594	Corn-Sheller.....	I, 362	15
595	Seeding-Machine.....	I, 483	100
596	Machine Belting.....	II, 285	461
597	Expansive-Bit.....	II, 330	490
598	Plough.....	I, 459	82
599	Nut-Blank.....	I, 564	143
600	Couch for Railroad-Cars.....	II, 219	415
601	Sugar-Mill.....	II, 311	480
602	Attachment for Tackle-Blocks.....	II, 52	300
603	Tempering Steel Car-Springs.....	II, 206	407
21, 604	Compound Railroad Axles.....	II, 148	III, 369



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21, 605	Metallic Frames for Vault-Light.....	II, 177	III, 386
606	Cracker-Machine.....	II, 454	579
607	Mowing-Machine.....	I, 432	62
608	Combined Cooking-Range and Heating-Apparatus.....	I, 741	254
609	Balance Sail Rig for Ships.....	II, 73	314
610	Heating Ovens by Steam.....	I, 740	253
611	Mechanical Power.....	II, 317	483
612	Harvester.....	I, 403	41
613	Dredging-Machine.....	II, 127	356
614	Cast-Iron Car-Wheels.....	II, 207	408
615	Ambulance Wagon.....	II, 231	423
616	Key-Hole Stop.....	I, 531	127
617	Lamp.....	I, 726	246
618	Machine for Planing Irregular Surfaces.....	II, 346	502
619	Bread and Cracker Machine.....	II, 433	566
620	Baker's Oven.....	I, 739	253
621	Machine for Adding Numbers.....	II, 85	324
622	Machine for Sawing Marble, Stone, &c.....	II, 390	542
623	Revolving Fire-Arm.....	II, 555	635
624	India-Rubber Car-Springs.....	II, 204	406
625	Cultivator.....	I, 368	20
626	Clothes-Dryer.....	II, 450	577
627	Lamp.....	I, 726	246
628	Riddles for Threshing-Machine.....	I, 499	109
629	Laying Submarine Telegraph Cables.....	II, 108	342
630	Plough.....	I, 459	82
631	Railroad Switch.....	II, 174	383
632	Rotary Pump.....	II, 254	438
633	Embroidering and Sewing Stand.....	II, 480	596
634	Laying Submarine Telegraph-Cables.....	II, 108	341
635	Machine for Making Wire Springs for Furniture.....	I, 582	161
636	Lock.....	I, 535	129
637	Churn.....	I, 352	7
638	Blind Operator.....	I, 504	111
639	Clothes-Dryer.....	II, 449	577
640	Hangers and Boxes for Shafting.....	II, 320	485
641	Cutting Threads of Wood Screws.....	I, 571	154
642	Seed-Drill.....	I, 375	23
643	Roofing-Machine.....	II, 169	379
644	Steam-Boiler Furnace.....	I, 715	240
645	Gate.....	II, 139	363
646	Fly-Trap.....	II, 614	666
647	Construction of Animal Traps.....	II, 613	666
648	Rolling Window-Blind.....	II, 179	387
649	Slate-Pencil Sharpener.....	II, 520	617
650	Screw Propeller.....	II, 69	310
651	Deflecting Plates for Circular Saws.....	II, 359	514
652	Lubricating Car-Axles.....	II, 184	390
653	Washing-Machine.....	II, 495	604
654	Carpet-Stretcher.....	II, 442	572
655	Cam for Throwing Bolts in Locks.....	I, 543	131
656	Fog-Signal Machine.....	II, 105	339
657	Knife to Cut Paper Bags.....	II, 514	614
658	Railroad Switch.....	II, 174	383
659	Folding Guides.....	I, 593	167
660	Carpet-Sweeper.....	II, 443	572
661	Steam Plough.....	I, 465	86
662	Grain-Cleaning Machine.....	I, 378	25
663	Gas-Metre.....	I, 679	223
664	Hay Rake.....	I, 468	89
21, 665	Washing-Machine.....	II, 495	III, 603

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21, 666	Rolling Railway Iron.....	I, 563	III, 149
667	Cotton-Scraper.....	I, 364	17
668	Gearing of Cut-off Valves for Steam-Engines.....	II, 49	298
669	Sewing-Machine.....	I, 640	203
670	Sewing-Machine.....	I, 641	204
671	Sewing-Machine.....	I, 641	204
672	Sewing-Machine.....	I, 640	204
673	Carpet-Sweeper.....	II, 444	573
674	Halters and Bridles for Horses.....	II, 402	549
675	Machine for Cutting Laths.....	II, 337	494
676	Construction of Animal Trap.....	II, 614	666
677	Baggage-Check.....	II, 596	656
678	Packing Pistons for Steam-Engines.....	II, 30	287
679	Photographic Baths.....	II, 520	617
680	Henip-Brake.....	I, 602	175
681	Harvester.....	I, 403	41
682	Valve for Steam-Engines.....	II, 49	298
683	Raising Dough for Bread.....	II, 456	580
684	Ballot-Box.....	II, 589	653
685	Card-Clothing.....	I, 586	164
686	Water Alarm for Steam-Boilers.....	II, 8	269
687	Spark-Arrester.....	II, 31	287
688	Transmitting Magnetic Signals on Railroads.....	II, 105	339
689	Bank Lock.....	I, 538	130
690	Cultivator.....	I, 368	20
691	Frip-Hammer and Anvil.....	I, 520	121
692	Rolls for Making Sheet Iron.....	I, 530	127
693	Distillation of Fresh Water from Salt Water.....	I, 689	216
694	Steam Water Tank.....	II, 38	292
695	Apple-Paring Knife.....	II, 421	560
696	Windlass for Moving Cars and Locomotives without Steam.....	II, 217	414
697	Tools for Manufacturing Goods of Caoutchouc.....	I, 662	216
698	Hay Rake.....	I, 468	89
699	Water Indicator for Steam-Boilers.....	II, 24	234
700	Machine for Cutting Root Grafts.....	I, 377	24
701	Carpet-Stretcher.....	II, 444	573
702	Cooking Boiler for Ranges and Stoves.....	I, 742	254
703	Ticket-Holder.....	II, 612	665
704	Wrappers for Cigars.....	II, 598	-----
705	Tannery.....	II, 417	III, 558
706	Manufacture of Candles.....	I, 661	215
707	Lining for Coal-Stoves and Furnaces.....	I, 758	264
708	Machine for Numbering the Pages of Books.....	II, 499	606
709	Slide for Skirt-Hoops.....	II, 577	648
710	Machine for Trimming the Edges of Paper Hangings.....	II, 515	615
711	Apparatus for Manufacturing Acids.....	I, 660	215
712	Hay Rake.....	I, 468	89
713	Sewing-Machine.....	I, 640	203
714	Cotton-Gin.....	I, 598	173
715	Seed-Drill.....	I, 3, 6	24
716	Machine for Stamping Trade-Marks on Cloth, &c.....	II, 607	662
717	Ice-Pitcher.....	II, 472	589
718	Crozing, Chamfering, and Bevelling Barrels.....	II, 328	489
719	Construction of Aquaria.....	II, 583	653
720	Machine for Planing Wood.....	II, 347	502
721	Artificial Leather.....	II, 407	-----
722	Sewing-Machine.....	I, 639	III, 203
723	Rollers for Calico-Printing.....	II, 528	621
724	Furnace for Heating Buildings.....	I, 711	238
725	Machine for Forming Barrels.....	II, 328	489
21, 726	Roach-Trap.....	II, 616	III, 667

No.	Invention or Discovery.	Text	Plates.
21, 727	Railroad-Car .....	II, 200	III, 404
728	Gas-Burner .....	I, 718	241
729	Saw-Gumner .....	I, 566	150
730	Revolving Fire-Arm .....	II, 555	635
731	Hot-Air Cook-Stove .....	I, 751	259
732	Adjusting Window-Blinds .....	II, 180	388
733	Gas-Burner .....	I, 719	241
734	Water-Closet .....	II, 124	354
735	Hinge .....	I, 523	122
736	Grain-Drill .....	I, 373	22
737	Car-Coupling .....	II, 192	398
738	Escapement for Time-Keepers .....	II, 114	346
739	Cultivator .....	I, 369	20
740	Machine for Peeling Willow .....	II, 617	667
741	Harvester .....	I, 404	41
742	Machine for Dressing Stone .....	II, 392	544
743	Machine for Sweeping Streets .....	II, 611	665
744	Circular Sawing Shingle-Machines .....	II, 364	522
745	Sewing-Machine .....	I, 642	205
746	Grinding and Polishing Knives .....	II, 465	585
747	Fastenings for Skirt-Hoops .....	II, 577	647
748	Portable-Boxes .....	II, 500	607
749	Machine for Cross-Seaming Sheet-Metal .....	I, 546	137
750	Construction of Iron Railings .....	II, 147	368
751	Sewing-Machine .....	I, 641	204
752	Sewing-Machine .....	I, 642	205
753	Water-Wheel .....	II, 269	441
754	Self-Closing Door .....	II, 125	355
755	Tanning .....	II, 416	-----
756	Centrifugal Pump .....	II, 251	III, 436
757	Water-Wheel .....	II, 260	441
758	Pen-holder .....	II, 519	616
759	Index for Book-Marker .....	II, 499	606
760	Tool for Chamfering Soles for Boots and Shoes .....	II, 399	548
761	Apparatus for Preserving Malt Liquors .....	I, 686	236
762	Knitting-Machine .....	I, 605	178
763	Cultivator .....	I, 369	21
764	Stirrup .....	II, 416	558
765	Gas-Regulator .....	I, 682	225
766	Box for Carriage-Wheel .....	II, 213	411
767	Truss-Pad .....	II, 568	643
768	Frames for Wire-Cloth, Paper-Making Cylinders .....	I, 614	184
769	Machine for Chamfering and Crozing Barrels .....	II, 323	469
770	Portable and Water-Proof Friction-Match Safe .....	II, 608	663
771	Separating Fibres from Pulp in Hemp-Leaves .....	I, 592	167
772	Sheet-Iron .....	I, 530	-----
773	Compound-Shell for Ordnance .....	II, 559	III, 638
774	Fire-Brick .....	II, 379	-----
775	Paper-Clamp .....	II, 514	III, 614
776	Life-Preserver .....	II, 60	305
777	Mowing-Machine .....	I, 433	62
778	Composition used as Building Material .....	I, 667	-----
779	Horse-Shoe Machine .....	I, 527	III, 125
780	Seedling-machine .....	I, 483	101
781	Lighting Street-Lamps by Electricity .....	II, 92	323
782	Rotary Planing Cutter .....	II, 345	502
783	Revolving the Chisel in Mortising-Machines .....	II, 343	499
784	Rule for Describing Polygonal Forms .....	II, 104	333
785	Farm-Gate .....	II, 139	363
786	Manufacture of Sugar .....	I, 697	-----
787	Cultivator .....	I, 369	III, 668
21, 788	Steam-Generator .....	II, 33	III, 289

No.	Invention or Discovery.	Text.	Plates.
21, 789	Cylinders and Pistons for Pumps and Steam-Engines.....	II, 16	III, 20
790	Corn-Eradicator.....	II, 582	639
791	Water-Wheel and Chute.....	II, 260	441
792	Harvester.....	I, 403	41
793	Loom for Weaving Hair-Cloth.....	I, 619	179
794	Rack for Holding Comb-Mach Cards.....	II, 607	663
795	Cotton-Gin.....	I, 598	173
796	Cans for Preserving Paint.....	I, 568	113
797	Coating Metals.....	I, 664	-----
798	Spelling-Block.....	II, 535	III, 623
799	Elastic Stair-Pad.....	II, 490	595
800	Sewing-Machine.....	I, 642	204
801	Pump.....	II, 249	434
802	Breech-Loading Fire-Arm.....	II, 548	633
803	Spading-Machine.....	I, 478	103
804	Harvester.....	I, 404	41
805	Extraction of Volatile Oils, &c., from Coal.....	I, 67	227
806	Skeleton Skirts.....	II, 578	648
807	Seeding Machine.....	I, 484	101
808	Coffee-Pot.....	II, 472	589
809	Gauge for Contents of Casks.....	II, 239	429
810	Composition for Paints.....	I, 688	-----
811	Opening and Closing Farm-Gates.....	II, 141	III, 365
812	Wrought Nails.....	I, 553	142
813	Cut-Off Valve for Steam-Engines.....	II, 48	297
814	Liquid Gauge.....	II, 239	429
815	Carpet-Sweeper.....	II, 444	573
816	Lubricator.....	II, 270	449
817	Sheet-Iron.....	I, 530	127
818	Post for Clothes-Lines.....	II, 451	578
819	Making Tight Joints around the Faucets of Water-Coolers.....	II, 497	605
820	Hammer.....	I, 520	121
821	Horse-Collar.....	II, 401	549
822	Machine for Lifting Heavy Weights.....	II, 263	446
823	Hammer Heads.....	I, 521	121
824	Plough.....	I, 460	83
825	Marine Propeller.....	II, 69	311
826	Paddle-Wheel.....	II, 65	308
827	Harvester.....	I, 404	41
828	Furnace for Tempering Steel.....	I, 712	233
829	Photographic Shield.....	II, 522	618
830	Stave-Jointer.....	II, 268	526
831	Apparatus for making Glass Stoppers for Bottles, &c.....	II, 378	534
832	Writing-Table.....	II, 483	596
833	Sewing-Machine.....	I, 643	205
834	Metallic Side Pavement.....	II, 146	368
835	Bottle for containing Mercury.....	I, 686	227
836	Water-Gauges for Steam-Boilers.....	II, 9	269
837	Hoisting Jack.....	II, 267	446
838	Re-sawing Machine.....	II, 358	513
839	Hoop-Shirts.....	II, 575	647
840	Maize Harvester.....	I, 417	50
841	Bedstead.....	II, 426	503
842	Combined Mop and Brush.....	II, 469	588
843	Field Fence.....	II, 134	361
844	Rolls for Planishing Iron.....	I, 529	127
845	Coffee-Roaster.....	I, 743	255
846	Plough.....	I, 460	83
847	Raking-Attachment to Harvester.....	I, 423	56
848	Clasps for Metallic or Other Flexible Bands.....	II, 265	444
849	Burglars' Alarm.....	II, 583	651
21, 850	Seeding-Machine.....	I, 483	III, 101

No.	Invention or Discovery.	Text.	Plates.
21, 851	Opening and Closing Gates by Approaching Vehicles.....	II, 141	III, 365
852	Submarine-Explorer .....	II, 78	318
853	Applying Electricity During Extraction of Teeth.....	II, 567	642
854	Harvester .....	I, 405	42
855	Umbrella .....	II, 582	650
856	Machine for Cutting Staves from the Bolt.....	II, 370	528
857	Cultivator .....	I, 370	21
858	Hydrant.....	II, 243	431
859	Paper-Feeder for Printing-Presses.....	II, 537	627
860	Nut-Machine.....	I, 555	143
861	Adjusting at a Right Angle the Joiner's Square .....	II, 336	493
862	Bank-Lock .....	I, 518	131
863	Car-Wheels of Cast-Iron .....	I, 529	-----
864	Lathe for Cutting Screws from Wire.....	I, 570	III, 153
865	Chronometer-Escapement .....	II, 88	325
866	Tools for Manufacturing Iron Riddles.....	I, 591	161
867	Washing-Machine .....	II, 496	604
868	Scrubbing-Machine .....	II, 479	594
869	Grain-Discharging Attachment to Harvesting-Machine.....	I, 425	58
870	Car-Seat .....	II, 197	401
871	Churn .....	I, 352	7
872	Extension Splints .....	II, 566	641
873	Steam-Pumping Engine .....	II, 15	275
874	Cider-Mill .....	II, 297	469
875	Washing-Machine .....	II, 495	604
876	Brick-Machine .....	II, 385	539
877	Grain Separator .....	I, 3-2	28
878	Bedstead Bottom .....	II, 427	563
879	Self-Mousing Hook .....	II, 58	304
880	Railroad-Switch .....	II, 174	323
881	Pen Fountain .....	II, 513	616
882	Machine for Making Candles.....	I, 661	215
883	Cheese Press .....	II, 272	451
884	Chimney-Cap .....	I, 702	233
885	Dining and Other Tables .....	II, 484	597
886	Spoke Machine.....	II, 357	525
887	Gasometer.....	I, 685	226
888	Brick-Machine .....	II, 385	539
889	Bridles to Prevent Horses from Kicking or Running Away.....	II, 400	549
890	Lamp-Wicks .....	I, 736	251
891	Flat-Iron .....	II, 462	584
892	Paddle-Wheel.....	II, 65	319
893	Hydro-Carbon Vapor-Burner .....	I, 701	233
894	Cotton-Press.....	II, 276	454
895	Transit Instrument .....	II, 116	346
896	Ornamenting Glass .....	II, 506	609
897	Refrigerator .....	II, 476	593
898	Elevating Water by Combustion of Volatile Hydro-Carbon.....	II, 256	439
899	Rail for Street-Railways.....	II, 165	377
900	Cooking-Stove .....	I, 754	263
901	Railroad Car-Coupling .....	II, 196	400
902	Copying-Press .....	II, 525	619
903	Washing Machine .....	II, 496	604
904	Operating-Pumps .....	II, 255	438
905	Insulating and Supporting Lightning-Rods .....	II, 98	314
906	Rope-Protector .....	II, 79	318
907	Steam-Engine .....	II, 13	274
908	Machine for Mining Coal .....	II, 144	367
909	Washing-Machine .....	II, 496	604
21, 910	Machine for Drawing Bolts .....	I, 506	III, 113

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21, 911	Applying Power to the Cranks of Engines .....	II, 16	III, 276
912	Bee-Hive .....	I, 315	2
913	Machinery for Pearling and Polishing Rice .....	II, 317	433
914	Apparatus for Generating Gas .....	I, 674	230
915	Apparatus for Cooling Worts .....	I, 689	231
916	Window-Stop .....	II, 183	339
917	Steam Vessel .....	II, 79	318
918	Steam Vessel .....	II, 81	321
919	Construction of Ocean Steamers .....	II, 76	316
920	Connection of Steam-Engines with Propellers .....	II, 82	321
921	Arithmetical Proof-Rule .....	II, 87	324
922	Preparation of Aluminium .....	I, 660	-----
923	Manufacture of Aluminium and Calomel .....	I, 660	-----
924	Patching Balls for Breech-Loading Rifles .....	II, 560	III, 638
925	Hinge .....	I, 523	123
926	Bureau Bedstead .....	II, 427	563
927	Composition for Roofing .....	II, 163	-----
928	Water-Metres .....	II, 256	III, 439
929	Sewing-Machine .....	I, 643	205
930	Forming Bats for Felt Cloth .....	I, 587	164
931	Machinery for Fulling the Cloth in the Piece .....	I, 588	164
932	Machinery for Combing Cotton .....	I, 590	166
933	Method of Hanging Swords .....	II, 612	665
934	Mechanism for Transmitting Rotary Motion .....	II, 315	481
935	Saw-Gummer .....	I, 566	150
936	Trucks for Locomotive Engines .....	II, 28	286
937	Tool for Chamfering Leather Straps .....	II, 409	554
938	Stove .....	I, 745	258
939	Gate-Hinge .....	I, 524	123
940	Raking Attachment to Harvesters .....	I, 423	57
941	Arithmometer for Addition .....	II, 87	325
942	Railroad Ditching-Machine .....	II, 152	371
943	Car Axle Boxes .....	II, 184	390
944	Machine for Cutting Corks .....	II, 600	659
945	Grain Separator .....	I, 382	28
946	[Suspended] .....	-----	-----
947	Bank Lock .....	I, 530	III, 131
948	Manufacturing Steel .....	I, 576	-----
949	Harpoon .....	II, 58	III, 303
950	Tackle Blocks .....	II, 231	459
951	Gas-Fitters' Vice .....	I, 581	160
952	Car Spring .....	II, 204	406
953	Plough .....	I, 460	83
954	Straw-Cutter .....	I, 494	107
955	Drinking Cup .....	II, 600	659
956	Railroad Chair .....	II, 151	370
957	Joint for T-Rail .....	II, 162	376
958	Seeding Machine .....	I, 485	102
959	Seeding-Machine .....	I, 485	102
960	Tap for Cutting Wooden Screws .....	II, 378	533
961	Die for Cutting Wooden Screws .....	II, 377	533
962	Lock and Key .....	I, 537	130
963	Threshing Machine .....	I, 418	108
964	Filtering Lock .....	II, 233	428
965	Sausage-Machine .....	II, 478	594
966	Shield Pin .....	II, 573	646
967	Car Seat .....	II, 197	401
968	Sash Fastener .....	I, 516	118
969	Seeding-Machine .....	I, 485	101
970	Straw-Cutter .....	I, 494	107
21, 971	Miners' Railroad Turn or Circular Switch .....	II, 159	III, 275

No.	Invention or Discovery.	Text.	Plates.
21, 972	Machine for Soldering .....	I, 574	III, 156
973	Smoking Tube .....	II, 610	664
974	[Suspended] .....		
975	Improvement in Ploughs .....	I, 460	III, 83
976	Presses for Embossing and Figuring Velvet .....	II, 525	620
977	Refrigerator .....	II, 476	593
978	Trap for Animals .....	II, 616	667
979	Tripping-Blocks for Boat Davits .....	II, 53	301
980	Hand Printing-Press .....	II, 536	627
981	Lifting-Handles .....	I, 522	122
982	Adjusting the Plummets in Surveying Instruments .....	II, 106	339
983	Hemp-Brake .....	I, 602	175
984	Combined Book and Slate .....	II, 499	606
985	Car Seat .....	II, 197	401
986	Railroad Chair .....	II, 151	370
987	Candlestick .....	I, 702	233
988	Preparing Wool and other Fibres for Spinning .....	I, 657	214
989	Creasing and Blacking Leather for Harness .....	II, 403	550
990	Pedal Attachment for Pianos .....	II, 524	619
991	Safety-Apparatus for Steam-Boilers .....	II, 7	269
992	Speed-Indicator and Recorder for Railroad Cars .....	II, 223	417
993	Harvester .....	I, 405	42
994	Lock .....	I, 536	129
995	Seeding-Machine .....	I, 484	101
996	Car-Brake .....	II, 1-6	391
997	Self Inking Hand-Press .....	II, 525	620
998	Axle-Box .....	II, 183	390
999	Weighing Carts .....	II, 2-2	459
22, 000	Padlock .....	I, 542	133
1	Billiard Table .....	II, 591	654
2	Improved Rudder .....	II, 81	320
3	Mechanical Movement .....	II, 296	468
4	Knitting-Machine .....	I, 607	178
5	Revolving Fire-Arm .....	II, 565	635
6	Flour Coolers .....	II, 2-8	464
7	Sewing-Machine .....	I, 644	206
8	Holding-Machine .....	II, 267	446
9	Apparatus for Wetting Paper .....	II, 517	616
10	Printing-Press .....	II, 534	625
11	Feeding out Paper from Printing-Presses .....	II, 536	626
12	Blacksmiths' Tuyere .....	I, 580	160
13	Plough .....	I, 461	83
14	Machinery for Pressing Tobacco .....	II, 279	456
15	Rendering Paper and other Fabrics Incorrodible .....	I, 689	
16	Propeller .....	II, 66	III, 309
17	Pen Fountain .....	II, 519	616
18	Lactal Instruments .....	II, 563	640
19	Aquaria .....	II, 588	653
20	Cushion for Billiard Tables .....	II, 593	655
21	Life Preserving Vests .....	II, 63	307
22	Operating Churn .....	I, 353	7
23	Opening and Closing Farm Gates .....	II, 140	364
24	Burglars' Alarm .....	II, 5-4	651
25	Sleeping Berths for Railroad Cars .....	II, 222	417
26	Rotary Harrow .....	I, 3-8	31
27	Printing-Press .....	II, 534	625
28	Shears for Cutting Sheet Metal .....	I, 573	155
29	Galvano-Electric Machine .....	II, 96	333
30	Bee-Hive .....	I, 345	2
31	Securing the Ends of Railway Bars .....	II, 163	377
22 032	Harvester .....	I, 405	III, 48

No.	Invention or Discovery.	Text.	Plates.
22, 033	Frames for Umbrellas and Parasols .....	II, 582	III, 650
34	Drop for Forging Metals .....	I, 519	119
35	Connecting Metallic Tiles, Plates, Beams, &c. ....	II, 175	384
36	Manufacture of White-Lead .....	I, 699	230
37	Elastic Material for Mattresses and Cushions .....	II, 466	586
38	Machinery for Manufacturing Shirred Goods .....	I, 694	229
39	Shirt-Bosom Folders .....	II, 574	646
40	Machine for Filing Saws .....	I, 567	152
41	Furnace for Tempering Steel .....	I, 712	239
42	Fringe Looms .....	I, 610	180
43	Lathe for Turning Wood .....	II, 340	497
44	Machine for Coiling Metal Pipe .....	I, 545	136
45	Sewing-Machine .....	I, 614	206
46	Rock-Drill .....	II, 128	357
47	Grubbing-Machine .....	II, 142	365
48	Lock .....	I, 536	130
49	Railroad Car-Wheel .....	II, 208	409
50	Sewing-Machine .....	I, 613	205
51	Skeleton Hoop-Shirts .....	II, 578	648
52	Dredging-Crane .....	II, 127	356
53	Washboard .....	II, 425	597
54	Bomb-Lance .....	II, 542	629
55	Knife-Sharpener .....	II, 464	585
56	Infant's Cradle .....	II, 414	579
57	Safe-Lock .....	I, 543	134
58	Lath-Machine .....	II, 336	494
59	Bee-Hive .....	I, 345	2
60	Machine for Making Spoons .....	I, 575	157
61	Shoe-Peg Machine .....	II, 413	556
62	Devices for Saving the Seed from Hay Fed to Stock .....	I, 426	58
63	Connecting Electro-Magnetic Apparatus with Tooth-Forceps .....	II, 563	640
64	Billiard-Table .....	II, 591	654
65	Power-Loom .....	I, 611	181
66	Sealing Preserve Jars .....	II, 463	535
67	Furnace for Burning Coal Dust .....	I, 710	237
68	Safe-Lock .....	I, 543	134
69	Vault-Light .....	II, 177	335
70	Vegetable-Cutter and Coffee-Mill Combined .....	II, 464	597
71	Electro-Magnetic Fire-Alarm Apparatus .....	II, 94	330
72	Straw-Cutter .....	I, 494	107
73	Hand-Hammer .....	I, 521	121
74	Binding Attachment to Harvester .....	I, 408	44
75	Astronomical Instrument .....	II, 87	325
	Automatic Feed-Boxes for Animals .....	I, 376	24
77	Harvester .....	I, 408	43
78	Animal-Traps .....	II, 613	665
79	Horse-Power Draught .....	II, 293	467
80	Breast-Pipes .....	II, 562	639
81	Registering Speed of Railroad Trains .....	II, 103	338
82	Telegraphic Instrument .....	II, 110	343
83	Machine for Sawing and Planing Shingles .....	II, 366	524
84	Harvester .....	I, 405	42
85	Hand-Drill .....	I, 514	117
86	Tongs for Coal .....	II, 464	597
87	Washboard .....	II, 425	597
88	Centre-Boards for Vessels .....	II, 7	318
89	Melodeon .....	II, 509	610
90	Churn .....	I, 313	7
91	Mould for Glass Bottles .....	II, 337	540
92	Forge-Hammer .....	I, 521	121
22, 093	Churn .....	I, 352	III, 669



No.	Invention or Discovery.	Text.	Plates.
22, 094	Breech-Loading Fire-Arm .....	II, 548	III, 631
95	Machine for Moulding Boot and Shoe Soles .....	II, 394	545
96	Ham-Fastener .....	II, 402	550
97	Ship-Building .....	II, 73	313
98	Spring-Bed Bottom .....	II, 424	561
99	Locomotive Lamp-Case .....	I, 732	249
100	Brailing-Machine .....	I, 545	163
101	Machine for Cutting Bongs .....	II, 332	491
102	Trimming the Edges of Boot and Shoe Soles .....	II, 393	545
103	Rail for Railroads .....	II, 161	375
104	Refrigerator .....	II, 477	593
105	Nash-Fastener .....	I, 517	118
106	Truss-Bridge .....	II, 122	352
107	Clamping and Feeding the Bolt in Fellow Sawing Machines .....	II, 357	513
108	Machine for Splitting Leather .....	II, 408	554
109	Apparatus for Heating and Ventilating Buildings .....	I, 721	244
110	Regulating the Winding of Time-Keepers .....	II, 115	346
111	Blacksmiths' Tuyere .....	I, 5-0	160
112	Chimney-Cap .....	I, 712	233
113	Machine for Breaking Stones .....	II, 391	543
114	Picker-Staff for Looms .....	I, 611	181
115	Mode of Baking Articles Composed of Carbon .....	I, 662	-----
116	Gearing .....	II, 288	III, 464
117	Straw-Carriers .....	I, 490	104
118	Gearing .....	II, 2-8	464
119	Brick-Moulds .....	II, 386	539
120	Cooking-Range .....	I, 742	254
121	Cooking Stove .....	I, 755	262
122	Screw-Wrench .....	I, 534	162
123	Inkstand .....	II, 508	610
124	Turnure .....	II, 581	649
125	Neutralizing Local Attraction of the Needle .....	II, 83	325
126	Furnace for Evaporating Sugar Juices .....	I, 695	230
127	Refrigerator .....	II, 477	593
128	Smut-Machine .....	II, 323	496
129	Moulds for Making Bottles .....	II, 378	534
130	Saddle-Tree .....	II, 412	555
131	Farm-Gate .....	II, 139	364
132	Preserving Surfaces of Cast or Wrought-Iron .....	I, 690	-----
133	Bottle for Ladies' Dresses .....	II, 519	III, 644
134	Grate-Bars .....	I, 720	242
135	Knitting-Machine .....	I, 607	178
136	Printing Names or Directions on Packages .....	II, 529	-----
137	Sewing-Machine .....	I, 645	III, 206
138	Ore-Separator .....	I, 557	145
139	Wind Musical Instrument .....	II, 511	612
140	Sewing Needles .....	I, 652	-----
141	Threshing-Machine .....	I, 498	III, 108
142	Parasols and Umbrellas .....	II, 5-2	650
143	Sewing-Machine .....	I, 646	207
144	Grain and Fruit-Dryer .....	I, 706	235
145	Reclining Chair .....	II, 446	574
146	Lock .....	I, 536	130
147	Cooking-Stove .....	I, 755	262
148	Sewing-Machine .....	I, 645	246
149	Machine for Making Envelopes .....	II, 515	619
150	Machine for Tarring Rope-Yarn .....	I, 618	186
151	Apparatus for Boring Wells .....	II, 178	337
152	Kettle for Trying Oils .....	I, 687	227
153	Curtain-Fixture .....	II, 435	580
22, 154	Tackle-Block .....	II, 52	III, 300

No.	Invention or Discovery.	Text.	Plates.
22, 155	Tool for Cutting Key-Seats in Wheels and Pulleys.....	I, 578	III, 159
156	Seed-Planter .....	I, 450	75
157	Pipe-Tongs .....	I, 580	147
158	Photographic Plate-Shield .....	II, 521	617
159	Scissors .....	II, 573	646
160	Sewing-Machine .....	I, 646	207
161	Apparatus for Assorting Eggs .....	II, 457	581
162	Fire-Engine .....	I, 710	235
163	Harvester .....	I, 406	43
164	Cut-Off Valves of Steam-Engines .....	II, 50	299
165	Pump .....	II, 250	435
166	Hose-Coupling .....	II, 240	429
167	Arrangement of Cutters for Turning Hubs .....	II, 373	529
168	Securing the Ends of Railway Bars .....	II, 163	376
169	Furnace for Steam-Boilers .....	II, 5	268
170	Steam-Trap .....	II, 37	291
171	Seeding-Machine .....	I, 496	102
172	Blind-Operator .....	I, 515	111
173	Hot-Air Furnace .....	I, 714	240
174	Preventing Injury from Rupture of Main-Spring of Watches .....	II, 119	348
175	Extensible Life-Raft .....	II, 63	307
176	Ashes and Garbage Safe .....	II, 583	653
177	Machine for making Window-Blind Slats .....	II, 179	387
178	Sediment Collector for Steam-Boilers .....	II, 7	269
179	Sewing-Machine .....	I, 646	207
180	Seeding-Machine .....	I, 496	102
181	Printing-Press .....	II, 534	626
182	Pump .....	II, 250	435
183	Corn-Planter .....	I, 433	66
184	Seeding-Machine .....	I, 496	102
185	Preservation of Flesh for Food .....	I, 699	227
186	Screw-Neck Bottles .....	II, 594	655
187	Shutter-Fastener .....	I, 517	118
188	Supporting Insulator for Lightning-Rods .....	II, 93	334
189	Gauge-Cock .....	II, 18	279
190	Apparatus for Holding Sheep .....	I, 467	103
191	Valve-Gear of Steam-Engines .....	II, 41	293
192	Valve of Steam-Engines .....	II, 49	298
193	Cutting Surfaces on Angular Pieces of Wood .....	II, 376	531
194	Under-Drain Plough .....	II, 147	368
195	Auger for Wood .....	II, 324	457
196	Securing the Ends of Railway Bars .....	II, 163	377
197	Ladies' Hoop-Skirts .....	II, 578	648
198	Valve-Gear of Locomotive-Engines .....	II, 40	292
199	Pasting Apparatus for Bag-Machines .....	II, 493	606
200	Steam-Engine .....	II, 13	274
201	Pump .....	II, 249	435
202	Brace-Post for Field-Fences .....	II, 135	361
203	Harvester .....	I, 407	43
204	Stop-Gate for Canals .....	II, 123	363
205	Crimping Boot-Soles .....	II, 395	545
206	Corn-Shelling Machine .....	I, 363	I, 16
207	Straw Cutter .....	I, 496	III, 107
208	Seeding-Machine .....	I, 485	102
209	Propeller .....	II, 68	309
210	Apparatus for Hoisting and Storing Ice .....	II, 605	661
211	Machine for Plating Nail-Heads .....	I, 548	133
212	Machine for Distributing Guano, &c. ....	I, 383	28
213	Railroad Car-Brake .....	II, 191	397
214	Hinge for Window-Blinds .....	I, 524	123
215	Cultivator .....	I, 370	21
22, 216	Hay and Cotton-Press .....	II, 277	III, 454

No.	Invention or Discovery.	Text.	Plates.
22, 217	Restoring Waste Vulcanized Rubber .....	I, 694	-----
218	Manufacture of Hard Rubber.....	I, 693	-----
219	Air Engine .....	II, 235	III, 426
220	Sewing-Machine.....	I, 647	208
221	Weavers' Shuttlcs.....	I, 653	21
222	Machine for Cutting Dovetailed-Mouldings .....	II, 342	499
2 3	Cooking-Stove .....	I, 755	263
224	Extension-Table .....	II, 482	596
225	Sewing Machine.....	I, 647	208
226	Sewing-Machine .....	I, 649	209
227	Washing-Machine .....	II, 497	605
228	Seed Planter .....	I, 451	75
229	Railroad-Car Brake.....	II, 191	397
230	Burner for Lamps.....	I, 728	247
231	Machine for Cutting Staves from the Bolt .....	II, 371	528
232	Horse-Rake .....	I, 469	90
233	Composition for Purifying Gas .....	I, 665	216
234	Door-Latch .....	I, 512	116
235	Horse-Rake .....	I, 469	90
236	Washing-Machine .....	II, 496	604
237	Harvester .....	I, 407	43
238	Wrought Nail Machine.....	I, 551	-----
239	Lime-Kiln.....	II, 389	542
240	Sewing-Machine .....	I, 647	208
241	Measuring and Recording by the Tape .....	II, 100	335
242	Bustles.....	II, 569	643
243	Supporting Furniture-Casters.....	II, 460	583
244	Platform-Scales .....	II, 231	458
245	Amalgamator .....	I, 501	110
246	Water-Proof Cork-Composition .....	I, 667	-----
247	Sealing Preserve-Cans .....	II, 440	III, 571
248	Edge-Keys for Boots .....	II, 399	548
249	Preventing Incrustation of Steam-Boilers.....	I, 690	228
250	Stove .....	I, 743	258
251	Grain and Grass-Harvester .....	I, 415	49
252	Guard for Circular-Saws.....	II, 359	514
253	Burner for Lamps.....	I, 728	247
254	Watch-Case .....	II, 117	347
255	Sewing-Machine .....	I, 648	208
256	Saw-Set .....	I, 566	150
257	Furnace for Melting Iron.....	I, 712	238
258	Life-Berth for Vessels .....	II, 59	304
259	Corn-Harvester .....	I, 411	47
260	Saw-Set .....	I, 566	150
261	Opening and Closing Gates by Approaching Vehicles.....	II, 141	365
262	Spindles for Throstle Spinning.....	I, 654	212
263	Billiard-Table Cushion .....	II, 592	654
264	Sewing-Machine .....	I, 648	208
265	Manufacture of Vulcanized Rubber-Goods .....	I, 693	-----
266	Securing the Arms to the Hubs of Propellers.....	II, 71	III, 311
267	Valves for Gas-Metres .....	I, 680	223
268	Saw-Mill .....	II, 349	504
269	Sewing Machine .....	I, 647	208
270	Burner for Vapor Lamp .....	I, 730	247
271	Device for Preventing Explosions in Steam-Boilers.....	II, 4	268
272	Stencil .....	II, 539	-----
273	Sewing-Machine .....	I, 649	III, 209
274	Wristband-Fastener .....	II, 582	650
275	Sewing-Machine.....	I, 649	209
276	Stove .....	I, 749	259
22, 277	Stove .....	I, 743	III, 258

No.	Invention or Discovery.	Text.	Plates.
22, 278	Tea and Coffee-Pot .....	II, 473	III, 590
279	Excavator .....	II, 132	359
280	Railroad-Brake .....	II, 121	350
281	Air-Engine .....	II, 235	426
282	Water-Wheel .....	II, 260	441
283	Car-Seats and Couches .....	II, 202	406
284	Feed-water and Blow-off Apparatus for Steam-Boilers .....	II, 5	268
285	Compositions for Tanning Leather .....	I, 666	-----
286	Machine for Making Hollow Bullets .....	II, 543	III, 629
287	Steam and Water-Alarm Gauge for Steam-Boilers .....	II, 21	281
288	Machinery for Forming Hat-Bodies .....	I, 599	173
289	Steam-Radiators .....	I, 740	284
290	Harness-Snaps .....	II, 404	551
291	Car-Brake .....	II, 187	391
292	Car-Spring .....	II, 204	406
293	Bandages .....	II, 561	639
294	Folding-Table .....	II, 482	506
295	Sled-Brake .....	II, 227	420
296	Engine-Hose .....	II, 240	-----
297	Folding-Chair .....	II, 445	III, 573
298	Shower-Bath .....	II, 561	639
299	Breech-Loading Cannon .....	II, 543	630
300	Children's Carriage .....	II, 210	410
301	Stair-Sweeper .....	II, 480	595
302	Machine for Turning Irregular Forms .....	II, 336	493
303	Steam-Boiler .....	II, 3	267
304	Adjustable Carriage-Seats .....	II, 210	410
305	Escapement for Time-Pieces .....	II, 115	346
306	Steam-Generator .....	II, 34	-----
307	Furnace for Evaporating Sugar Juices .....	I, 696	III, 230
308	Forceps for Fastening Clasps on Hoop-Skirts .....	II, 579	649
309	Bee-Hive .....	I, 345	2
310	Nut-Machine .....	I, 555	144
311	Lamp-Shade Supporter .....	I, 734	250
312	Harvester .....	I, 407	43
313	Water-Gauge for Steam-Boilers .....	II, 22	222
314	Attaching Carriage Thills to Axles .....	II, 212	411
315	Fluid-Metre .....	II, 245	432
316	Cultivator .....	I, 371	21
317	Cradle for Dry Docks and Marine Railways .....	II, 129	357
318	Slide Valve-Gear of Steam-Engines .....	II, 42	293
319	Lock .....	I, 536	130
320	Apparatus for Operating Valves of Steam-Engines .....	II, 50	299
321	Valve-Gear of Steam-Engines .....	II, 41	293
322	Valve of Steam-Engines .....	II, 50	299
323	Machine for Drilling Metals .....	I, 514	117
324	Fire Escape-Ladder .....	I, 707	236
325	Breech-Loading Cannon .....	II, 544	630
326	Raking-Attachments to Harvesters .....	I, 423	57
327	Lamp .....	I, 726	246
328	Heels for Boots and Shoes .....	II, 397	547
329	File Cutting-Machine .....	I, 518	119
330	Machine for Cutting Soap .....	I, 695	229
331	Applying Gas for Heating and Illuminating .....	I, 719	242
332	Plough .....	I, 461	83
333	Slide Valve-Gear for Oscillating-Engines .....	II, 41	293
334	Steam-Boiler .....	II, 3	267
335	Gas-Burning Stove .....	I, 757	263
336	Straw-Cutter .....	I, 495	107
337	Cleaning Rice .....	II, 318	483
22, 338	Car Seats and Couches .....	II, 203	III, 406

No.	Invention or Discovery.	Text.	Plates.
22, 339	Seeding-Machine .....	I, 486	III, 103
340	Pegging-Jacks. ....	II, 410	555
341	Harvester .....	I, 408	44
342	Stove .....	I, 749	259
343	Composition for Roofing .....	II, 168	-----
344	Cut-off Gear for Steam-Engines .....	II, 17	III, 278
345	Harvester .....	I, 408	43
346	Propeller for Life-Boats .....	II, 68	310
347	Ellipsograph .....	II, 95	332
348	Breech-Loading Revolving Fire-Arm .....	II, 549	632
349	Pepper Cruet .....	II, 455	580
350	Shingle .....	II, 366	523
351	Preserve-Can .....	II, 439	570
352	Buckle .....	II, 400	548
353	Bagasse Furnace .....	I, 709	236
354	Carpet-Fastener .....	II, 441	571
355	Slide and Fastening for Skirt-Hoops .....	II, 577	643
356	Balancing Millstones .....	II, 310	479
357	Hydrant .....	II, 243	431
358	Extension Finger-Ring .....	II, 533	628
359	Machine for Separating Garlic from Grain .....	II, 290	465
360	Horse-Power for Driving Reciprocating Saws .....	II, 293	467
361	Cut-off Gear for Steam-Engines .....	II, 17	279
362	Medicated Fabrics .....	II, 564	-----
363	Paper File .....	II, 513	III, 614
364	Seats and Sleeping Couches for Railroad Cars .....	II, 222	417
365	Hanging Window-Sash .....	II, 182	388
366	Portable Fan .....	II, 571	645
367	Scissors .....	I, 568	152
368	Gathering Grain upon and Discharging it from Harvester ..	I, 424	57
369	Hoop Lock .....	II, 334	492
370	Bottle-Stopper .....	II, 594	655
371	Folding-Bench .....	II, 590	654
372	Machine for Elevating Hay .....	II, 265	444
373	Buoyant Propeller .....	II, 67	310
374	Seeding-Machine .....	I, 487	103
375	Draughting Shirts .....	II, 574	647
376	Railroad Rail .....	II, 154	372
377	Quoins for Gun Carriages .....	II, 557	636
378	Self-Adjustable Levelling Instrument .....	II, 97	334
379	Machine for Boring Wood .....	II, 331	490
380	Governor for Steam-Engines .....	II, 24	283
381	Brush .....	II, 434	567
382	Boiler-Furnace .....	I, 710	237
383	Harness Buckles .....	II, 403	550
384	Hominy-Mill .....	II, 300	471
385	Buckle for Skirt Hoops .....	II, 576	647
386	Mitre-Box .....	II, 342	499
387	Cam-Press .....	II, 272	449
388	Dynamometer .....	II, 90	327
389	Plough .....	I, 461	83
390	Labels for Trees .....	II, 606	662
391	Apparatus for Purifying Gas .....	I, 676	221
392	Stove .....	I, 750	259
393	Glass Furnaces and Pots .....	II, 387	540
394	Attaching Cutting Lips to Auger Shanks .....	II, 325	457
395	Smut-Machine .....	II, 393	466
396	Instrument for Measuring Altitudes .....	II, 86	394
397	Watch-Faces .....	II, 118	348
398	Clothes-Frames .....	II, 450	577
22, 399	Hemp-Brake .....	I, 602	III, 175

No.	Invention or Discovery.	Text.	Plates.
22, 400	Machine for Turning Tapering Twists on Wood.....	II, 374	III, 530
401	Paper Pulp from Wood.....	I, 615	184
402	Faucet.....	II, 237	428
403	Ice-Pick.....	II, 606	662
404	Bootjack.....	II, 432	566
405	Letter Envelope.....	II, 504	608
406	Manufacture of Pyrogenic Oil.....	I, 687	227
407	Apparatus for Destructive Distillation.....	I, 669	216
408	Apparatus for Destructive Distillation of Wood, &c.....	I, 669	217
409	Lamp.....	I, 726	246
410	Manufacture of Artificial Fuel.....	I, 708	-----
411	Grain Measure.....	II, 99	III, 334
412	Revolving Fire-Arm.....	II, 555	635
413	Compensating Pendulum for Clocks.....	II, 90	326
414	Printing-Press.....	II, 535	626
415	Stamp-Extractor.....	II, 173	362
416	Stove.....	I, 750	259
417	Steering Propeller.....	II, 69	311
418	Seeding-Machine.....	I, 487	103
419	Spring Bottom for Chairs and other Seats.....	II, 447	575
420	Shuttle Boxes for Looms.....	I, 613	182
421	Sash-Fastener.....	I, 517	118
422	Propeller for Boats.....	II, 68	310
423	Mechanical Typographer.....	II, 541	628
424	Furnace for Burning Lime.....	I, 710	237
425	Lock.....	I, 537	130
426	Ladies' Hooped Skirts.....	II, 578	648
427	Breech-Loading Cannon.....	II, 544	630
428	Adjusting Tripper to Escapement Lever of Time Keepers.....	II, 115	346
429	Inkstand.....	II, 429	610
430	Tool for Slotting Clothes Pins.....	II, 372	529
431	Propelling and Steering Apparatus.....	II, 71	312
432	Spring Tackle Block.....	II, 52	300
433	Preserving Fruit.....	II, 459	-----
434	Gas Retort.....	I, 684	III, 225
435	Clothes-Horse.....	II, 451	573
436	Fruit-Can.....	II, 438	570
437	Cultivator.....	I, 371	21
438	Seed-Planter.....	I, 451	76
439	Locomotive Axle Bearings.....	II, 25	284
440	Machine for Picking Corn.....	I, 359	12
441	Door-Spring.....	I, 575	157
442	Shirt-Stud.....	II, 574	646
443	Corsets.....	II, 571	644
444	Iron Pavement.....	II, 145	367
445	Device for Transmitting Rotary Motion.....	II, 315	481
446	Blind-Fastener.....	I, 515	117
447	Lathe for Turning Masts, &c.....	II, 339	496
448	Iron Railing.....	II, 147	369
449	Lath-Machine.....	II, 336	493
450	Core for Moulding Plastic Substances.....	II, 387	540
451	Pestles for Cleansing Clothes.....	II, 452	578
452	Burnishing Attachment for Lathes.....	I, 507	113
453	Steering Apparatus.....	II, 77	317
454	Trace-Fastening.....	II, 419	559
455	Railroad Car-Brake.....	II, 192	397
456	Bedstead-Fastening.....	II, 423	563
457	Apparatus for Walking on the Water.....	II, 84	322
458	Dredging-Machine.....	II, 127	356
459	Burnishing-Machine.....	I, 508	113
23, 460	Manufacture of Starch.....	I, 696	-----

No.	Invention or Discovery.	Text.	Plates.
22, 461	Washing-Machine .....	II, 497	III, 606
462	Railroad Car Seats and Couches .....	II, 203	406
463	Apparatus for Generating Illuminating Gas .....	I, 678	221
464	Closet for Sewing-Machines .....	II, 448	576
465	Burner for Vapor Lamps .....	I, 730	247
466	Edge Tools .....	I, 578	159
467	Life-Preserving Trunk .....	II, 63	306
468	Cutting Apparatus for Harvesters .....	I, 413	48
469	Door-Fastener .....	I, 512	116
470	Turn-Buckle for Window-Blinds .....	I, 507	112
471	Railroad Car-Seat .....	II, 200	404
472	Blasting or removing Sub-marine Bodies .....	II, 119	350
473	Stacking Agricultural Products .....	I, 489	104
474	Expanding Bit .....	II, 329	490
475	Stacking Agricultural Products .....	I, 489	104
22, 476	Cast-Iron Mercury Bottle .....	I, 529	III, 127

## ADDITIONAL IMPROVEMENTS.

No.	Invention or Discovery.	Text.	Plates.
184	Plough, [15,654] .....	II, 653	III, 673
185	File-Cutting Machine, [16,691] .....	653	671
186	Machine for Smoothing Planed Surfaces, [17,992] .....	653	674
187	Cider-Mill, [16,040] .....	653	672
188	Covering for Drawing-Rolls, [17,754] .....	654	-----
189	Millstone Dress for Hulling Rice, [12,408] .....	654	III, 673
190	Bullet-Mould, [16,910] .....	654	-----
191	Life-Preserving Berths, [18,090] .....	654	III, 672
192	Limekiln, [18,635] .....	654	672
193	Cutting Flour-Mill, [15,060] .....	654	672
194	Steam Plough, [19,427] .....	654	673
195	Clasps for Metallic Hoops, [18,779] .....	655	671
196	Hanging Carriage Bodies, [8,236] .....	655	671
197	Automatic Railroad Car-Brake, [18,150] .....	655	-----
198	Hand Printing-Press, [18,557] .....	655	III, 673
199	Rotary Blast-Producing Chair, [19,343] .....	655	671
200	Tightening the Tires of Carriage-Wheels, [19,721] .....	656	671
201	Polishing Apparatus for Watchmaker's Lathes, [12,502] ..	656	674
202	Shingle-Machine, [17,906] .....	656	674
203	Trap for Animals, [17,397] .....	656	674
204	Revolving Fire-Arm, [20,765] .....	656	671
205	Corn-Planter, [19,242] .....	656	674
206	Swing-Bolt for Fastening Shutters, [14,912] .....	656	670
207	Clasps for Metallic Hoops, [18,779] .....	657	671
208	Attaching Lamps to Lanterns, [20,785] .....	657	672
209	Propeller, [12,823] .....	657	674
210	Cotton-Gin Feeder, [18,410] .....	657	671
211	Rotary Pump, [21,318] .....	657	674
212	Manufacture of Soap, [19,754] .....	657	-----
213	Brick-Machine, [20,109] .....	657	III, 673
214	Car-Seats and Couches, [21,536] .....	II, 638	670













